आनोभद्राःक्रतवोयन्तुविश्वतः

Let noble thoughts come to us from every side…

Sardar Patel Institute of Technology

Munshi Nagar, Andheri (W), Mumbai-400058

(Autonomous College Affiliated to the University of Mumbai)

Ph. D. Programs

Doctoral Degree (Ph. D.) Program in

Engineering and Technology

(Revised in Academic Year 2022-2023)

Index

Sr. No.	Name	Faculty	Specilization
1	Dr. Y. S. Rao	EXTC, Electronics, COMP	Embedded, IoT, Digital Power Electronics
2	Dr. Sudhir N. Dhage	COMP	Cloud Computing
3	Dr. Surendra Rathod	Electronics	VLSI
4	Dr. DhananjayKalbande	COMP	AIML, DS, Soft Computing
5	Dr. K.T.V Reddy	EXTC	Telecommunication
6	Dr.UdayPanditKhot	EXTC	VLSI
7	Dr. RadhaShankarmani	COMP	DBMS
8	Dr. Padmaja Joshi	COMP	AIML
9	Dr. KushalTuckley	EXTC	Microwave
10	Dr. J.W. Bakal	COMP	Network Security
11	Dr. PoojaRaundale	MCA	DBMS
12	Dr. Rajendra Sutar	Electronics	BioMedical
13	Dr. AartiKarande	MCA	AIML
14	Dr. Anant V. Nimkar	COMP	AIML
15	Dr. PrachiGharpure	COMP	Software Engg.
16	Dr. Sujata Kulkarni	EXTC	AIML
17	Dr. Deepak Karia	Electronics	Wireless Communication
18	Dr. Sukanya Kulkarni	EXTC	Microwave
19	Dr. ReenaSonkusare	EXTC	VLSI
20	Dr. Sudhakar Mande	Electronics	VLSI
21	Dr.Baban U Rindhe	EXTC	Microwave
22	Dr. B N Chaudhari	Electronics	Power Electronics, Control Systems
23	Dr. R R Sawant	Electronics	Power Electronics, Control Systems
24	Dr. B K Mishra	EXTC	Communication Engg.
25	Dr. P Bhavathankar	COMP	AIML/DS

4. Research Review Committee

Sr. No.	Name	Affiliation
1	Dr. S Biswas	IIT-Bombay
2	Dr. Rohin Daruwala	VJTI-Mumbai
3	Dr. Sasi Kumar	CDAC-Mumbai
4	Dr. Dhirendra Mishra	Mukesh Patel University
5	Dr. Gummadilakshmimadhumati	Siddhartha COE, AP
6	Dr. Manish Goswami	IIIT, Allahabad
7	Dr. Dheeraj Kumar Sinha	IIIT, Bhagalpur
8	Dr. ManojNagmode	Govt. COE, AvasariKhurd
9	Dr. Rahul Dahatonde	SPCE, Mumbai
10	Dr. Jagannath Nirmal	KJSCOE, Vidyavihar
11	Dr. G. Thampi	TSCOE, Bandra
12	Dr. Saurabh Pratap	IIT, BHU
13	Dr. Santosh Singh Rathore	IIIT, Gwalior
14	Dr. Kaushal Bhardwaj	IIIT, Manipur
15	Dr. Sanjay Shitole	UMIT, SNDT
16	Dr. Atulkemkar	SIES GST
17	Dr. Dhaval Patel	GE, USA
18	Dr. Gantikrishnasarma	JNTU, Hyderabad
19	Dr. Shiva Akula	SASI, Godavari
20	Dr. Mahesh Shirole	VJTI, Mumbai
21	Dr. R RShedamkar	TCOE, Kandivali
22	Dr. Ketan Shah	SVKM, Vileparle
23	Dr. Amit Deshmukh	DJSCOE, Vileparle
24	Dr. Dalia Nandi	IIIT, Kalyani
25	Dr. SuhasGajre	SSGS, Nanded
26	Dr. V S Patil	ADCOE, Ashta
27	Dr. MadhavChandane	VJTI, Mumbai
28	Dr. Zia Sakib	Reliance JIO, Mumbai
29	Dr. Padmaja P Joshi	CDAC, Juhu
30	Dr. S N Mali	DYP, Pune
31	Dr. VijayaParagBalpande	PriyadarshiniJ.L.COE, Nagpur
32	Dr. Jonathan Jai Joshi	Eduvance, Mumbai
33	Dr. Lakshmi Sudha	SIES GST, Navi Mumbai
34	Dr. N. Bheema Rao	NIT, Warrangal
35	Dr. Umakanth Nanda	VIT, Amaravathi
36	Dr. Abhishek Sharma	Intel Corporation, Oregon, USA
37	Dr. Venkat Kolli	MCE, Hassan
38	Dr. P B Pokle	RKNEC
39	Dr. B G Patil	Walchand COE, Sangli
40	Dr.Sachin D Ruikar	Walchand COE, Sangli
41	Dr. Usha Rani Nelakuditi	Vignan University
42	Dr. Ravi Sekhar	Vignan University
43	Dr. SwamitTannu	WISC, USA
44	Dr. P C Saroj	EBC, Khargar
45	Dr. Sachin. B. Umbarkar	EATON, Mumbai

46	Dr. PreetiVinayakray	DBIT
47	Dr. Anjana Ghule	GOV. COE Aurangabad
48	Dr. Smita Chavan	GOV. COE Aurangabad
49	Dr. G. Anuradha	Siddhartha Univ. Vijayawada
50	Dr. Mary Sowjanya	Andhra University, Vizag

5. Synopsis /Expert Review Committee

Sr. No.	Name	Affiliation
1	Dr. B.K.Lande	VJTI
2	Dr. KushalTuckley	AVG Systems
3	Dr.UddavBhosale, Vice Chancellor	Swami Ramanand Teerth
4	Dr. Avinash Vaidya	Pillai COE
5	Dr. Shubha Pandit	K J S COE
6	Dr. Shrija Unnikrishnan	FRCE
7	Dr. Deepak Bhoir	FRCE
8	Dr. Karandikar	K J S COE
9	Dr. Vinit Dongre	TCOE
10	Prof. Shabbir N. Merchant	IIT-Bombay
11	Dr. ArvindKiwelekar	BATU
12	Prof. Vahida Akhtar	COE, Pune
13	Dr. Sunil Dhore	Army Institute of Technology
14	Dr. Ashok Pundir	NITTE, Powai
15	Dr. Siddhartha Sengupta	TCS
16	Dr. Sanjay Shitole, Principal	SNDT University
17	Dr Dinkar Prasad, Dean	Shivnad University
18	Dr. Y Ravi Sekhar, Dean	Vignan University
19	Dr. TelagathotiPitchaiah, HoD	Vignan University
20	Dr. P. Joshua Reginald	Vignan University
21	Dr. S Sivaji	Vignan University
22	Dr.JayashreeShinde, HoD	SNDT University

6. Ph.D. Awardees

S. N	Name of the Awardee	Branch& DOJ	Registration	Defended
1.	BhavarthePramod	EXTC/ Jan-2015	15/29-12-2016	5/11/2018
2.	Sukanya A Kulkarni	EXTC/ Jan-2013	7/24-11-2014	4/2/2019
3.	SonkusareReena S.	EXTC/ July-2013	10/23-12-2014	30/3/2019
4.	Madhavi Harish Waghmare	EXTC/ Jan-2013	11/30-12-2014	02/11/2019
5.	Tusharika S Banerjee	EXTC/ Jan-2013	9/27-11-2014	15/12/2020
6.	Marathe Dipak Sitaram	EXTC/ Jan-2013	6/17-11-2014	15/12/2020
7.	Bhagat Narendra Anant	EXTC/ Jan-2013	8/25-11-2014	03/10/2022
8.	TaleleKiranTulshiramVasumati	EXTC/Jan-2013	12/21-01-2015	07/06/2023
9.	Sankhe Darshana Nimesh	EXTC/Jan-2016	18/18-11-2017	01/04/2023
10.	Sawant Ashwini Satish	EXTC/Jan-2019	39-2/06/2021	05/10/2023
11.	Ambawade Dayanand D	EXTC/Jan-2013	14/04-03-2015	20/09/2024
1.	AartiMilindKarande	COMP/ Jan-2013	1/15-07-2014	08/03/2019
2.	Kailas KisanDevadkar	COMP/ July-2013	2/15-07-2014	15/12/2020
3.	Natasha Raul	COMP/ Jan-2015	16/03-04-2017	02/11/2022
4.	SurekhaDholay	COMP/ Jan-2015	17/12-04-2017	12/09/2022
5.	Kavita Mahesh Kelkar	COMP/Jan-2013	3/19-07-2014	30/06/2023
6.	Pawar Dipti Rohan	COMP/July-2017	29/29-01-2019	18/11/2023
7.	/Kakad Shital Arun	COMP/ July-2017	32/29-01-2019	20/12/2023
8.	Bide Pramod Jagannath	COMP/ July-2017	24/29-01-2019	08/07/2024
9.	/Pawar Renuka Sahebrao	COMP/ July-2017	19/11-12-2018	22/05/2024
10.	/Sisodia Jignesh Amarsingh	COMP/July-2017	22/29-01-2019	
11.	/ModakMasooda Mohamed Aslam	COMP/July-2017	26/29-01-2019	
1.	Kapure Vijay Ramesh	ETRX/July-2017	20/29-01-2019	29/06/2023
2.	/Keshwani Vidya Rajesh	ETRX/July-2017	27/29-01-2019	21/03/2024
3.	/Shah Payal Hitesh	ETRX/July-2017	30/29-01-2019	19/10/2024
4.	/Keshwani Vidya Rajesh	ETRX/July-2017	27/29-01-2019	
5.	Goswami Siddhant Arun	ETRX/July-2018	41/09-09-2021	

6. PhD Completed Summary

Electronics - 5

Electronics and Telecommunication - 11

Computer Engineering - 11

7. Current Research Scholars

7.1 MCA/10

Sr. No.	Name	DOJ
1	/Nagar Mayura Rupesh	MCA/Jan-2016
2	/Kulkarni Manasi Mohan	MCA/Jan-2016
3	/Zaibunnisa Malik	MCA/July-2017
4	MirzaAvaisbaigIdrisbaig	MCA/Jan-2023
5	Sonu Gupta	MCA/Jan-2024
6	Sumeet Rathod	MCA/July-2024

7.2 Electronics and Telecommunication/20

Sr. No.	Name	DOJ
1	Sawant Dattatray S.	EXTC/Jan-2019
2	/Raut Karishma Sachin	EXTC/Jan-2020
3	/KadamSejalAmeya	EXTC/Jan-2020
4	/RambhiaJeenalMulchan	EXTC/ Jan-2020
5	/Hemalata Mahesh Mote	EXTC/ Jan-2020
6	MilindPandurangParaye	EXTC/ Jan-2020
7	/Joshi Sonia	EXTC/ July-2021
8	/VatkarShilpaNaresh	EXTC/July-2021
9	Gangurde Pallavi Anil	EXTC/ Jan-2023
10	SagaleKaustubhShivaji	EXTC/ Jan-2023

7.3 COMPUTER/30

Sr. No.	Name	DOJ
1	Manish Parmar	COMP/Jan-2013
2	/Lakshmi M Gadhikar	COMP/Jan-2013
3	/Vijaya.B	COMP/Jan-2013
4	Anand Godbole	COMP/Jan-2015
5	/LadgeLeenaVishwajit	COMP/July-2017

6	/MullaNikahat Sammie	COMP/July-2017
7	/Ambekar Neelima Sagar	COMP/July-2018
8	/Kshirsagar Prachi Prashant	COMP/July-2018
9	Prathmesh N. Gunjgur	COMP/Jan-2020
10	/Sindhu S. Nair	COMP/Jan-2020
11	/KurleSamidhaPradeep	COMP/Jan-2020
12	/Anuja Ajay	COMP/Jan-2020
13	/Salmani Sakina Banu Shahrukh	COMP/Jan-2020
14	/Surve Divya Prathmesh	COMP/Jan-2020
15	/KurhadeSwapnaliRavikumar	COMP/Jan-2020
16	/Dalvi Prachi Harshal	COMP/July-2021
17	/Ramrakhiani Nikita Anil	COMP/July-2021
18	/Vaswani Rani Sneh	COMP/July-2021
19	/ZopeVidyaSachin	COMP/July-2021
20	/Nikhat Fatma Mumtaz Husain Shaikh	COMP/Jan-2022
21	Ramteke Jyoti Yashwant	COMP/Jan-2023
22	ShindeKarunaSukaji	COMP/Jan-2023
23	Abha Tewari	COMP/July-2023
24	HodageAnujaSuryakant	COMP/July-2023
25	Goyal Shaily	COMP/July-2023
26	Versha Hole	COMP/Jan-2024
27	Sunil Ghane	COMP/Jan-2024
28	Harshil Kanakia	COMP/July-2024
29	Pallavi Thakur	COMP/July-2024

7.4 Electronics/10

Sr. No.	Name	DOJ
1	MahindUmeshSarjerao	ETRX/July-2017
2	/ThakkarRushaliRitesh	ETRX/July-2017
3	/Bera Aprajita S.	ETRX/Jan-2019
4	Tulashidas Mane	ETRX/Jan-2022
5	GovindTukaramHaldankar	ETRX/Jan-2023

Annexures

Different application forms employed in Research programs

Sr. No.	Application form
1	Research Topic Approval
2	Research Title Approval
3	Progress Seminar
4	Pre-Synopsis Approval by external
5	Pre-Synopsis Approval stage 1
6	Thesis Submission Approval
7	Thesis submission form
8	University of Mumbai Application for Extension for Research Student
9	University of Mumbai Research Advisory Committee Presentation of research proposal and RAC Comments
10	Attendance Sheet of Ph.D. (Technology) Synopsis/Thesis Viva-Voce Examination
11	Ph.D. (Technology) Open Defence Viva Voce Committee
12	Notice of Ph.D. (Technology) Open Defence Viva-Voce Examination
13	Ph.D. (Technology) Open Defence Viva Voce of Research Scholar's Attendance
14	Notice of Ph.D. Online Open Defence Viva Voce with Venue details
15	Letter of Appointment for Question paper Setting
16	Ph.D. Course work Completion Certificate with Grades
17	Ph.D. Course work Completion Certificate
18	Research work Progress not satisfactory
19	Research Scholar's attendance certificate
20	Invitation as co-guide from SP-IT center
21	Letter to University to Appointment and approval of Co-Guide
22	NOC from a Competent Authority of the Institution of the External Guide to Supervise candidate's work of PhD.
23	Consent Letter to be a Ph.D. Guide from external supervisor
24	Securing a No Objection Certificate (NOC) from SP-IT to obtain approval from the Research Supervisor for pursuing an application to an alternative research center.
25	Request letter from Research scholar to SP-IT to appoint Supervisor from other centers
26	Obtaining a No Objection Certificate (NOC) from SP-IT to seek approval from the Research Supervisor for applying to another research center
27	Appointment as a Ph.D. Supervisor to Research Scholar
28	Member of Research Advisory Committee (RAC)
29	Research Recognition Committee (RRC) Meeting Minutes
30	Research Experience Certificate
31	Discontinuation of Ph.D. registration.

1. About Sardar Patel Institute of Technology (SP-IT):

We are Sardar Patel Institute of Technology (SP-IT), a leading engineering college in the heart of India's financial center of Mumbai. With consistent efforts, we have grown over the years to be recognized as one of the best institutes for aspiring engineers.

We are a part of the Bharatiya Vidya Bhavan and function as an autonomous Institute with entrepreneurial agility. We strive to influence, practice and promote value-based growth. We build on this mission through pedagogic innovations and pioneering programmes, which have helped us stand out for our unique and distinctive path in engineering education.

SP-IT has consistently ranked high in the National Institutional Ranking Framework (NIRF), Govt. of India. NIRF has been accepted by MHRD and outlines a methodology to rank institutions across the country. The parameters are - Teaching Learning & Resources, Research & professional practice, Graduation Outcome, Outreach & Inclusivity, and Perception. The only Engineering Institute granted Empowered Autonomy Status by the University of Mumbai from 2023-24.

1.1 Mission of SP-IT:

- Provide high-quality education in engineering and technology promoting the Indian Values and Ethos that will prepare the participants to lead lives of personal integrity and civic responsibility in a global society.
- Promote an Educational Environment that combines academic study with the excitement of intellectual curiosity for engineers of tomorrow.
- Enhance career opportunities for students through Industry-Institute interaction, value-added courses, and projects in cutting-edge technology.
- Inculcate Entrepreneurial mindset in students to make them job creators.
- Focus on applied research to create next-generation technologies.

1.2 Vision of SP-IT:

"To build a renowned institute which will produce graduate engineers with global competency and social sensitivity."

2. Doctoral Program at SP-IT

At Bharatiya Vidya Bhavan's Sardar Patel Institute of Technology, research is an integral part of the academic activity carried out within various undergraduate and postgraduate programs. The Research and Development (R&D) center facilitates various research programs by channelizing various research projects and consultancy works in various departments of the Institute. The Research activities include Academic research and funded research projects and patents.

The advancement of laboratories is a key role of the Research and Development center of the institute. The Research and Development center acts as a liaison between funding agencies and the Institute to handle sponsored research projects and industrial consultancy assignments. The main objective is to maintain the quality and breadth of its research enterprise, and particularly for its openness to multidisciplinary research.

The scope and scale of research has substantially evolved from the era of student theses to funded projects to interdisciplinary research programs at state and national level. The Centre facilitates interaction with external agencies at national and international level. By looking at changing requirements of industry, the objective of Research and Development Cell is to forge a future while shaping technology through innovative application by improving methods and techniques and by being creative to design new products.

Institute offers Ph.D. Programs, affiliated to University of Mumbai, in four departments. The broad objective of the Ph.D. Program is to keep pace with the ever-expanding frontiers of knowledge in Engineering and Technology culminating into the contemporary social and economic objectives of the country.

The academic Program leading to Ph.D. degree is based on course credit requirement and research thesis as per the guidelines of UGC. The Institute also encourages research in interdisciplinary areas through a system of joint supervision by academicians or Industry personnel.

The presence of a strong research-oriented faculty provides excellent opportunities for such Program. Facilities for research work leading to Ph.D. degree are currently available in the Departments of Computer Engineering, Electronics and Telecommunication Engineering, Electronics Engineering, Master of Computer Applications.

All the academic and administrative matters related to the Ph. D. center shall be supervised by Dean R&D. The records of registration and progress of research work done by the Ph.D. students shall be maintained by the Ph.D. center.

3. Following are the programs offered and intake capacity at SP-IT:

Sr. No.	Programs	Type	Intake
1	B. Tech. Computer Engineering	Undergraduate	240
2	B. Tech. Computer Science and Engineering	Undergraduate	120
3	B. Tech. Electronics and Telecommunication	Undergraduate	120
4	M. Tech. Computer Engineering	Postgraduate	18
5	M. Tech. Electronics and Telecommunication	Postgraduate	18
6	MCA	Postgraduate	60
7	Ph.D. Computer Engineering.	Research	30
8	Ph.D. Electronics and Telecommunication Engg.	Research	20
9	Ph.D. Electronics Engg.	Research	10
10	Ph.D. MCA	Research	10

4. Research Supervisors:

Dr. Y. S. Rao

Email : ysrao@spit.ac.in

Contact no: 9820962870

Guide Approval: Computer, Electronics, Electronics and Telecommunication Engineering

Dr. Y.S. Rao is a professor and academic & research dean at Sardar Patel Institute of Technology. His research interests are Embedded System, Digital Power Electronics, VLSI Design, Wireless Sensor Networks. He has 50+ publications. He has also fetched grants for different projects. Organized and attended various seminars and workshops.

Dr. Sudhir N. Dhage

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Contact no: 9869318074

Guide Approval: Computer Engineering

Dr. Sudhir N. Dhage is a Professor in Computer Engineering and Dean-Administration at Sardar Patel Institute of Technology, Affiliated to University of Mumbai. His area of Interest is Algorithms, Artificial Intelligence, Machine Learning, Natural Language Processing, Pattern Recognition, Image and Video Computing, Biomedical Applications, Cloud Computing, Data Security, Parallel and Distributed Systems, and Data Science. He has 28 years of experience in academics, research and administration. Under his supervision 03 research scholars successfully completed PhD degrees and two research scholars recently submitted thesis. To his credit 02/07 Books/Books chapters, 03 patents, 19 publications in refereed journals as well as 62 Publications in international conference proceedings. He has been awarded “Best Ph.D. Thesis Award” for the year 2016 presented by the Computer Society of India at Science cIty, Kolkata. He has been awarded the``RashtriyaSanman Award” presented by the National Education and Human Resource Development Department in October-2012. He is a member of IEEE and Life Member of the Computer Society of India for the last 22 years.

Dr. Surendra Rathod

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Contact no: 9920228275

Guide Approval: Electronics Engineering

Presently working as a Principal at Fr. Conceicao Rodrigues College of Engg , Bandra He has more than 22 years of teaching experience. His special fields of interest include VLSI design, device modeling and circuit simulation. He is recognized Ph.D. guide of Mumbai University for Electronics Engineering and Electronics & Telecommunication Engineering. He has published more than 60 papers in various national and international conferences and journals. He has received more than 10 different honors and awards. He has also conducted seminars cum workshops at more than 15 educational campuses in Maharashtra State on 'outcome based education'. He received "ISTE Best Engineering College Teacher Award for Maharashtra State" in year 2012. He also received 'Shiksha Rattan Award' and 'Certificate of Excellence' in year 2012 by International India Friendship Society, New Delhi from Mr. G. V. G. Krishnamoorthy (former Election Commissioner Govt. of India), Mr. Joginder Singh (CBI Director) and Mr. VedPrakash (AICC Secretary). He was invited by CISCO, San Francisco USA to deliver webex presentation to all the world wide CISCO community.

Dr. Dhananjay Kalbande

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Contact no: 9820383928

Guide Approval: Computer Engineering

He is currently a Professor and Head in Computer Science & Engineering Department, at Sardar Patel Institute of Technology, Mumbai. With a Ph.D. in Technology, Post-Doctorate from TISS ,and over 23+ Years of experience in teaching & research, his areas of interest include everything from Soft Computing (Neural Networks, Fuzzy Logic), Computer Networks and more to Human Machine Interaction, Decision Making, Business Intelligence, Mobile Application Development and Technology for a social ,healthcare and rural development. In addition to authoring several books and has conducted several expert seminars. He has patented 9 innovative ideas. He has published several papers in various national and international conferences and journals. He has also conducted seminars cum workshops. "AiM4u Software Solutions Pvt.Ltd." is my startup incorporated on 20th June 2023 aimed at developing affordable IT-enabled[tele-medicine] healthcare services mainly focusing on skin related issues and also providing education services via Skill-based Internship Programs in the area of Artificial Intelligence,Computer Vision, Machine Learning and Deep Learning.

Dr. K. T. V. Reddy

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Contact no: 9820701995

Guide Approval: Electronics and Telecommunication Engineering

Currently he is a Dean, Faculty of Engineering and Technology, Datta Meghe Institute of Medical Science (DU), Wardha. He is having over three decades of Teaching, Research and administration experience. Because of his strong technical knowledge in Wireless Networks, Mobile networks, RFID, Microwaves, Digital Signal Processing, Satellite Communications, Radar Engineering and Telecommunication Network Design under his supervision four students completed Ph.D. and five students are in progress. More than dozen students completed M.E/M.Tech. thesis and over 100 UG projects. He published over 100 papers in the National and International journals and conferences. Delivered over 200 invited talks and organized over 150 conferences/workshop. He is well known academician and strong administrator because of his hard work and strong commitment he has received several awards at National and International level. Prof (Dr) K T V Reddy is the “Youngest” President in the history of IETE since 1953.

Dr. Uday Pandit Khot

Email : udaypandit@rediffmail.com

Contact no: 9167370622

Guide Approval: Electronics and Telecommunication Engineering

Currently working as a Professor at St. Francis Institute of Technology, Borivali. He has over 27 years teaching experience and having more than 70 publications in different journals and conferences. He has fetched grants for different projects. He has also conducted and attended several workshops/seminars. His research interests include Analysis and synthesis of analog circuits in current mode, Fault diagnosis in analog and digital circuits, VLSI circuits, Embedded systems, Switched-capacitor circuits, Microwave circuits, Wireless communication systems, Artificial Intelligence & Machine Learning, Image & Video Processing, Control Systems. He is honored with various awards.

Dr. Radha Shankarmani

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Contact no: 9821691846

Guide Approval: Computer Engineering

Over 25 years of teaching experience and more than 40 publications in various journals and conferences. She has actively participated in numerous workshops and seminars. Her research interests span a wide range of topics, including Simulation & Modeling, UML using Rational Rose, Software Testing, Software Engineering, Software Architecture, Databases and Data Mining, Business Intelligence, E-Business Technology, Big Data Analytics.

Dr. Padmaja Joshi

Email : padmaja@cdac.in

Contact no: 9870186793

Guide Approval: Computer Engineering

Dr. Padmaja Joshi currently works at Centre for Development of Advanced Computing as a Senior Director. Padmaja's interest areas are Software Engineering, Mobile Software Engineering, Mobile Cloud Computing, e-Governance, Blockchain Technology, Cyber Security. She is working on multiple projects within these domains. She has more than 30 publications.

Dr. Kushal Tuckley

Email : kushal_tuckley@rediffmail.com

Contact no: 9869069155

Guide Approval: Electronics and Telecommunication Engineering

Dr. Tuckley is an expert in DSP, Radar, RF and Microwave Systems. An IIT Bombay BTech, MTech & PhD, he served with Society for Applied Microwave Electronics Engineering & Research (SAMEER), Ministry of Electronics & Information Technology, Government of India for 24 years and held the position of HoD - DSP Department before venturing out in the private sector in 2008. Subsequently, after a brief one year stint with Astra Microwave Products Ltd, he has been heading the core R&D activities at AGV Systems Pvt. Ltd. He also serves as a Director of DisCo Systems Pvt. Ltd. on behalf of AGV.

Dr. J.W. Bakal

Email : bakaljw@gmail.com

Contact no: 9820723812

Guide Approval: Computer Engineering

Prof (Dr.) J W Bakal, is a President, IETE and Principal, Shivajirao S Jondhale College of Engineering, Dombivli, a Director In-charge of School of Engineering and Applied Sciences, University of Mumbai. Dr Bakal has 32 years of Industry and Academia experience. Published more than 100 papers in International Journals. He already has 7 patents to his credit. He has guided 10 PhD Students and Mentored more than 50 M.Tech. students. Dr Bakal is transformational leader. At present he is transforming IETE in digital era through Research & Development, Centre of Excellence on Technologies, Policy Advocacy and innovative ideas.

Dr. Pooja Raundale

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Contact no: 9322020589

Guide Approval: Master of Computer Applications (MCA)

She is currently Dean, Quality Assurance and Professor in (MCA) Computer Science & Engineering Department, at Sardar Patel Institute of Technology, Mumbai. With a Ph.D. in Science and Technology, ,and over 25+ Years of experience in industry, teaching & research, her areas of interest include Neural Networks, Fuzzy Logic, Artificial Intelligence, Mobile Application Development and Technology. She is a well-known speaker and expert for FDPs and training, and has conducted several expert seminars. She has published several papers in various national and international conferences and journals. She is founder director of OMIST consultancy, a technological startup in the area of Artificial Intelligence, Machine Learning, data science and Deep Learning.

Dr. Rajendra Sutar

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Contact no: 7021702904

Guide Approval: Electronics and Telecommunication Engineering

Dr. Rajendra Sutar, has been working as Associate Professor in the department of Electronics & Telecommunication Engineering at Sardar Patel Institute of Technology, Mumbai. He has over 25 years of teaching experience. He had been working as Dean Academics at S.P.I.T. from 2019 to 2022. He has Several publications to his credit in reputed International Journals and conferences. He has guided 5 M.Tech. students and has been guiding 2 Ph.D. students. His research areas include Biomedical Electronics, Power Electronics.

Dr. Aarti Milind Karande

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Guide Approval: MCA

Dr. AartiMilindKarande, Assistant Professor in Sardar Patel Institute of Technology, completed her Postdoctoral internship on the topic "Enterprise Architecture Quality framework" From CDAC Mumbai in May 2023. She completed her Ph.D. in Computer Engineering, S.P.I.T from Mumbai University on topic “Modeling Software Solution leveraging soft computing techniques to improve business process agility” in Mar '2019. She completed her M.Tech. (Computer Engineering) from V.J.T.I. on the topic “Integrated service management using Service Oriented Architecture” in 2011. She completed her B.E. (Computer Engineering) from Shah and Anchor Kutchhi Engineering collegein 2001. She published a good number of journal papers along with International conferences. Her expertise is in the domain of AI, Soft computing, Cloud Computing, Machine Learning, Deep Learning and Enterprise architecture. She worked as a resource person in 30+ workshops and served as session chair in conferences. Apart from this, she had successfully completed her training and professional certifications in Agile Project Management (from APMG) & COBIT 5 (from ISACA). She has also been recognized as best faculty by Cognizant for Year’17. She is also currently handling 1. IIC S.P.I.T. as a president, Faculty chair for NISP S.P.I.T., Women in Engineering IEEE Student branch counselor alone with many administrative heads.

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Guide Approval: Computer Engg.

Dr. Anant V. Nimkar is Associate Professor in Computer Engineering at Sardar Patel Institute of Technology (S.P.I.T.) Mumbai India. He has over 22 years of teaching experience. He received a BE(CSE) from Amravati University in 2001. He completed M.Tech. (IT) from IIT Kharagpur in 2008. He received Ph.D. (CSE) from IIT Kharagpur in 2016. His research interests include Information & System Security, Artificial Intelligence & Machine Learning, Distributed Algorithms & Soft Computing.He has 50+ publications to his credit in reputed

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Served as the Principal at Bharatiya Vidya Bhavans' Sardar Patel Institute of Technology inAndheri (West), Mumbai from March 2008 to June 2019. Presently holding the position of Director at NMIMS Indore Campus, SVKM's NMIMS Deemed to be University-Indore Campus, from July 2019 to March 2023.

I have imparted various courses in computer engineering, employing innovative teaching and learning methods. Additionally, I am currently supervising the research work of five Ph.D. students affiliated with the University of Mumbai.

My research focuses on E-learning and Software Engineering, resulting in the publication of numerous research papers in esteemed journals, including the IEEE Transactions on Education. I also served as the Chairperson of the Adhoc Board of Studies (Computer) for Mumbai University from June 2012 to 2015.

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Dr. Sujata S Kulkarni holds the position of Associate Professor at Sardar Patel Institute of Technology. Her areas of expertise encompass Pattern Recognition, Communication and Networking, Wireless Communication Networks, and Embedded System. She has completed post post-doctorate from SRTMUN in Machine Learning. She has completed Ph..D. in Image processing and pattern Recognition.

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Guide Approval: Electronics Engineering

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Dr. Sukanya Kulkarni holds the position of Associate Professor at Sardar Patel Institute of Technology. Her areas of expertise encompass Wireless & Mobile Communication, Digital Communication, Antenna & Microwave engineering, Random Signal Analysis.

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Dr. ReenaSonkusare holds the position of Associate Professor at Sardar Patel Institute of Technology. Her areas of expertise encompass Fiber Optic Communication, Microwave Engineering, and VLSI Design.

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Guide Approval: Computer Engineering

Presently serving as the Principal at Don Bosco Institute of Technology, my areas of interest include VLSI Design, Nanoelectronics, and Embedded Systems.

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With 23 years of experience, I am presently serving as a Professor at K C College of Engineering. My areas of expertise include Advanced Communication, Optical Networks, and Wireless Networks.

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Guide Approval: Electronics Engineering

Currently serving as the Principal at Sardar Patel Institute of Technology in Mumbai, I earned my Ph.D. from IIT Bombay in 2001. With a background in Electrical Engineering, I previously worked as an Electrical Engineer at Garware Plastics and Polyester Limited. Additionally, I held positions as a Lecturer at Marathwada Institute of Technology and as a Design Engineer at the Centre for Electronics Design and Technology, DoE, Government of India Selection, based in Ahmedabad.

My teaching experience includes serving as a Lecturer and Assistant Professor at Government College of Engineering Aurangabad, securing positions through MPSC selection. In 2002, I achieved the rank of Professor through MPSC selection at the College of Engineering, Pune.

With a wealth of over 30 years of experience, I have actively contributed to various committees and boards. I am a member of the Building Works Committee, Board of Studies in Instrumentation and Control at Pune University, and Board of Studies in Electrical Engineering at North Maharashtra University. Moreover, I am involved in the Finance Committee at Dr. B. A. T. University, Lonere, and serve on the Academic Council of the same institution.

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Presently employed as a Professor at Sardar Patel Institute of Technology, I earned my Bachelor of Engineering degree in Electrical Engineering from Marathwada University in 1988. Following that, I completed a Diploma in Business Management from Marathwada University in 1990. Subsequently, I pursued my Master of Technology in Electrical Engineering from the Indian Institute of Technology, Bombay, graduating in 1996. I further advanced my academic journey by obtaining a Doctor of Philosophy (Ph.D.) in Electrical Engineering from IIT Bombay in 2009.

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Guide Approval: Electronics and Telecommunication Engineering

Dr. B.K. Mishra was born in 1966 and earned his Bachelor of Engineering in Electronics from Amravati University in 1988. He completed his M.E. in Electronics and Communication Engineering in 1992 and obtained his Ph.D. in Engineering in Electronics & Communication Engineering from Birla Institute of Technology, Ranchi, in 1998. With a prolific academic career, Dr. Mishra has authored over 50 technical papers published in national and international journals and conferences. Since 2006, he has been serving as the Principal of Thakur College of Engineering & Technology. His areas of expertise encompass Communication Engineering, Electronic Circuits, and Microstrip and UWB Antennas.

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Title of the Thesis: Efficient Peak To Average Power Reduction Techniques For OFDM System

Abstract:

Orthogonal frequency division multiplexing (OFDM) has been adopted in many international standards such as Wireless Local Area Networks (WLAN), World Wide Interoperability for Microwave Access (WiMAX) or Long-Term Evolution (LTE) since it is possible to achieve high speed data transmissions over frequency selective fading channels in the last decade. However, the OFDM signals exhibit high amplitude fluctuations causing the peak-to average power ratio (PAPR) problem. The high PAPR of OFDM signal envelope may occasionally drive high power amplifiers (HPAs) to operate in the nonlinear region of their characteristic leading to out-of-band radiation, reduction in efficiency of transceiver system. Researchers worldwide have contributed to a plethora of research to PAPR reduction techniques such as signal limiting, signal scrambling and redundancy techniques. Signal limiting techniques such as Clipping, Companding reduce PAPR of the transmit signal but nonlinear distortion components are generated at the output of the high-power amplifier resulting in inefficient transceiver systems, while redundancy techniques such as coding increases side information causing data rate loss. Signal scrambling techniques such as Selective Level Mapping (SLM) and Partial transmit Sequence (PTS) are also considered promising for PAPR reduction. Considerable research undertaken on these techniques in the recent past in order to reduce PAPR shows that SLM performs better than PTS. However, in SLM, issues such as data rate loss due to transmission of side information, high nonlinear distortion and increased computational complexity resulting in reduced efficiency of transceiver need to be investigated. In this thesis, an efficient PAPR reduction technique either in terms of reduced nonlinear distortion or reduced computational complexity is addressed. All the proposed research techniques in this thesis can be considered as modification of the Conventional Selective Level Mapping Technique applicable to wireless OFDM networks such as WLAN, WiMAX or LTE. ii Modifications are proposed to the existing criteria for phase sequence set selection, additional metrics to select phase sequence sets is proposed. PAPR reduction for single and multiple input SLM-OFDM systems is achieved by novel orthogonal phase sequence set based on Golay complementary pairs. It was observed that higher the number of candidate signals, the PAPR reduction is higher and since orthogonal sequences are used data rate loss is avoided. The proposed phase sequence set outperforms the Walsh-Hadamard phase sequence set use in conventional SLM and a 3dB PAPR reduction for 16 candidate signals, 64 subcarrier system was achieved in comparison

to OFDM. Quantitative analysis of nonlinear distortion of transmit signal was carried out with HPA modelled using Rapp model. Error magnitude vector (EVM), in-band distortion metric, Adjacent Channel Power Ratio (ACPR), out of band distortion metric and Bit Error Rate (BER), the overall transceiver quality metrics for the proposed SLM were evaluated for 64 and 128 subcarrier systems and different number of candidate signals. Simulations results considering WLAN specifications are EVM of 12%, BER of 10-5 at Signal to noise ratio (SNR) of 23dB and ACPR of -60.2 dBr for 16 candidate signals, 64 subcarrier system. The RMS EVM is high resulting in high BER. SNR requirement of Proposed SLM is 23dB whereas it is 12.5 dB for OFDM for same BER resulting in an SNR penalty of 9.5dB compared to OFDM. The overcome the detrimental effects of nonlinear distortion and improve power efficiency, a novel subblock partitioned precoded SLM technique is proposed. Unitary precoders such as Discrete cosine Transform (DCT)-II and DCT-IV is applied with adjacent subblock partitioning to the proposed SLM-OFDM. The various performance parameters such as PAPR, EVM, ACPR and BER were evaluated. It was observed that there is a marginal improvement in PAPR for 16 candidate signals, 64 subcarrier Precoded SLM-OFDM compared to proposed SLMOFDM. But RMS EVM, a measure of nonlinear distortion has reduced by about 50% and BER of 10-5 is achieved at SNR of 13dB, 0.5dB improvement over OFDM while -66.53 dBr ACPR is achieved thereby reducing nonlinear distortion. DCT-IV precoder outperforms DCT-II since it possesses better correlation properties.

Research Publications:-

1. Sukanya A kulkarni and B.K. Mishra, “Analysis of Peak to Average Power Reduction Technique in Presence of Nonlinear Distortion”, at the 7th International Conference & Workshop on Electronics & Telecommunication Engineering (ICWET 2016), held on 26th-27th Feb. 2016 at TCET, Mumbai.
   http://digital-library.theiet.org/content/conferences/cp700

2. Kulkarni S., Mishra B.K. (2017),“PAPR Performance Analysis of Unitary Transforms in SLM-OFDM for WLAN 802.11a Mobile Terminals”, Computer Communication, Networking and Internet Security, Lecture Notes in Networks and Systems, vol. 5 , pp 179-187,Springer, Singapore.
   DOI 10.1007/978-981-10-3226-4_17

3. Kulkarni, Sukanya. A., & Mishra, B.K.(2017). A Low Complexity Iterative SLM-OFDM for SHF band applications. Journal of Microwaves, Optoelectronics and Electromagnetic Applications, 16(3), 615-627. https://dx.doi.org/10.1590/2179-10742017v16i3819

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Title of the Thesis: Analysis of FinFET for Analog Performance and its Application in Analog Circuit

Abstract:

In modern electronics and communication systems, the major driving force have been primarily based on down-scaling the minimum transistor size according to Moore0 s law. Furthermore, the efforts to overcome limitations of planar technology have led to development of non-traditional architecture such as Fin shaped Field Effect Transistor (FinFET) and other multigate devices to achieve compactness. A FinFET, self-aligned process is more resilient to short channel effects in nanometre technology node. In addition to the non-planar nature of multi-gate devices, several technology integration challenges such as the availability of compact model that need to be addressed before it can be accepted by circuit designers as a feasible technology. The Figure of Merit (FoM) of analog circuits is significantly influenced by the analog performance of the device technology. This thesis endeavours to connect the device-circuit co-design gap that has severely improved circuits performance using emerging FinFET devices. Considering the nanometreFinFET device technology, an attempt is made to enhance the analog performance parameters by engineering the geometrical structure of FinFET device. The device structure is a three dimensional (3-D) architecture of Silicon on Insulator (SOI) 30nm FinFET with a high-κ hafnium oxide as gate electrode operated in both strong inversion as well as weak inversion regime for low power and low voltage.. To demonstrate the influence of the improved analog performance parameters of proposed device on circuit performance, it is integrated within analog circuits where low power dissipation is highly desired.

Research Publications:-

Journal

1. ReenaSonkusare, P. Pilankar, A. Saini, and S. S. Rathod,“ Design of SOI FinFET based Two Stage Operational Transconductance Amplifier,” IEEE VLSI Circuits and Systems Letters, vol. 3, no. 3, pp. 26-37, Oct. 2017.

2. ReenaSonkusare, P. Pilankar, and S. S. Rathod,“ Analysis of Subthreshold SOI FinFET based Two Stage OTA for Low Power,” Analog Integrated Circuits and Signal Processing (Springer Journal), Aug. 20, 2018.
3. ReenaSonkusare, Ninad S. Chitnis, and S. S Rathod,“ Total Ionising Dose Effects on HF O2 and AL2O3 Gate Oxide SOI FinFET,” International Journal of Creative Research Thoughts (IJCRT), vol. 5, no. 4, pp. 2289-2293, Dec. 2017.
4. ReenaSonkusare, P. Pilankar,A. Gosavi, K. Sutar, and S. S. Rathod,“ Design and Analysis of SOI FinFET based Three Stage OTA with Nested Gm-C Frequency Compensation,” IEEE VLSI Circuits and Systems Letters, (accepted for publication on Oct. 5, 2018).

Conferences

(1) ReenaSonkusare, S. S. Rathod, “Analysis of Multifin n-FinFET for Analog Performance at 30nm Gate Length,” IEEE International Conference on Communication and Electronic Systems (ICCES-2016), 21-22 Oct. 2016, Coimbatore, India.

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Title of the Thesis: Enhancement of Bandwidth for Broadband Communication by Using Photonic Bandgap Structure in Optical Fiber

Abstract:

Objective of this research work is to develop a novel photonic crystal fiber (PCF) structure that can provide enhanced bandwidth for broadband fiber optic communication. In order to obtain higher bandwidth utilization, large negative dispersion flattened over a broadband telecommunication range and negligible confinement loss is expected from the novel design.

Existing technology, research from other research scholars, new developments in the area of PCF and technological aspects of PCF are discussed suitably in the initial part of the thesis. Methodology to carry out the research work is also briefly discussed.

Second part of the thesis discusses about establishing an equivalence between wave propagation in conventional PCF without defect in core, using Finite Difference Time Domain (FDTD) technique and a transmission line matrix (TLM) method. In doing so, various wave propagation parameters like reflection coefficient, characteristic impedance, propagation constant, guided wavelength are computed from the electric and magnetic field simulated by Lumerical Finite Difference Eigenmode (FDE) solver used in FDTD and Mode Solutions modules of Lumerical suite. The terminating impedance at the far end of the PCF is also estimated from the standing wave pattern by using impedance transformation on the line. The wave propagation parameters have been investigated as a function of incident wavelength to model the dispersive nature of the PCF. Results obtained by Lumerical FDE solver were compared with the outcome of TLM model of conventional PCF without any introduction of defect in the core.

We also reported computation of equivalent models for defects in conventional PCF. Investigation carried out to demonstrate how a defect can be modelled as a reactive element by placing it across transmission line. Then we investigated conventional PCF structures with air hole or dielectric rod as a defect in solid core, in order to realize both capacitive and inductive nature of defects. In this case also, results obtained by Lumerical FDE solver were compared with the outcome of TLM model of conventional PCF without any introduction of defect in the core.

In the third and final part of the thesis, four variants of PCFs were modelled using hexagonal lattice structure. Defect or subwavelength inclusion was introduced in the solid core in the form of an array of circular holes. Each variant has different combinations of the patterned air holes in the cladding and core region. FDTD simulation was carried out in order to study the effect of variation of geometrical parameters on bandgap bandwidth, dispersion, nonlinearity, effective area and confinement loss. The final and optimized PCF (termed as CiHo PCF) structure demonstrated dispersion in the range of -600 ps/(nm.km) to -704 ps/(nm.km) covering the O to U spectral telecommunication range (i.e. 1260 nm to 1675 nm) and -704 ps/(nm.km) at 1550 nm. Confinement loss was observed to be very negligible in the order of 10-8 . When compared with the previous work of other research scholars, simulation results were found to be encouraging. Simulation results of a novel PCF structure were validated using LC analytical model.

In addition to the above, the design of above final and optimized Ci-Ho PCF structure was extended to create three variants of new highly birefringent (HB) PCFs. Simulations were carried out to analyze the effect of changes in geometrical parameters on bandgap bandwidth, dispersion, birefringence and confinement loss. The final and optimized HB PCF (termed as Type-III HB PCF) reported a dispersion of -635 ps/(nm.km) at 1550 nm , near zero confinement loss and birefringence of the order of 10-2

Research Publications:-

Conference Publications

1. M. H. Waghmare and Dr. K. T. V. Reddy “Analysis of Photonic Bandgap Structure in 2- D hexagonal and square lattice structure of Photonic Crystal”, IEEE Explore Digital Library Proc. ISBN: 978-1-4799-7320-0 International Conference on Advanced in Communication and Computing Technology ICACACT-2014), P.V.P.P., Sion, Mumbai, India, pp. 1-4, April 2014.
2. M. H. Waghmare and Dr. K. T. V. Reddy “Numerical Analysis of Propagation in Finite Length 2D Photonic Crystal Fiber Using Transmission Line Method”, IEEE Explore Digital Library Proc. ISBN: 978-1-5090-1666-2/16/ 2016 International Conference on Computing communication and Automation (ICCCA-2016), Galgotia University, Greater Noida, India, pp. 1594-1599, April 2016.

Journal Publications

1. M. H. Waghmare and Dr. K. T. V. Reddy “Design and Modal Analysis of Photonic Crystal Fiber for Dispersion Compensation over Broadband Range”, Journal of Microwaves Optoelectronics and Electromagnetic Application, Brazilian Microwave and optoelectric society, ISSN 2179-1074 , Vol. 15, No.4 , pp. 365-379, December 2016.
2. M. H. Waghmare and Dr. K. T. V. Reddy “A Novel Structure of Photonic Crystal Fiber for Dispersion Compensation Over Broadband Range”, Sadhana-Springer Journal of Indian Academy Proceeding in Engineering Science, ISSN 0256-2499, Vol.42, No.10, pp. 1-5, October 2017.

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Title of the Thesis: Numerical and Analytical Study for Microwave Generation Using Backward Wave Oscillator

Abstract:

Microwave generation for higher output power is done through Vacuum Electron Devices (VEDs). Among the general known sources for microwave generation, the most known can be listed broadly as Backward Wave Oscillators (BWOs), Extended Interaction Klystron (EIKs), Travelling Wave tubes (TWTs), Gyrotrons, Free-electron Lasers (FELs) and beamline sources.BWO has been reported as one of the most promising sources for HPM generation.The microwaves which have nano-pulses at pulse length of several microseconds duration, kilowatt(kW) power and beyond and energy content of kilojoules(kJ) find tremendous applications in modern and strategic applications especially.Such microwaves generate momentarily very high power and have less average power, these are used for medical or defence applications primarily.Much higher output power in range of kilowatt and beyond can be generated if 2Dimensional sheet electron beams are used as these have higher extended interaction area to overcome the severity of electron-electron repulsion in a better way.Typically, maximum efficiency claimed is between 20-40% experimentally.Working efficiency of the BWO always depends on beam-wave interaction, which can be achieved by stable beam transportation of high current beam through slow wave structure (SWS).Overall efficiency of sheet beam driven BWO will depend on beam wave interaction.The sheet electron beam needs electron beam bunching in such a way so as to be able to pertain its original beam geometry leading to better beam confinement.The focussing of sheet electron beam cannot be done through the conventional ways (uniform axial magnetic field generated from solenoidal structures) due to the difference in the physics of electron alignment in case of such 2D sheet electron beams.

In this research we present the effect of non-uniform/periodic magnetic field on the efficiency of a sheet beam driven C-band BWO (operational in Megawatt power regime) through MAGIC3D Particle-In-Cell simulation.The analysis is done numerically and analytically on sheet electron beam initially to bring out the prediction in behaviour of

charged particles through Sheet Beam Analysis.Parameter calculation for C-Band BWO is done later.Eventually, in simulation as non-uniform/ periodic magnetic field lines are applied at 90 kV beam energy, 200A beam current and 0.6 T average magnetic field to C-band BWO, our results depict an efficiency of nearly 65% due to improved electron beam confinement and electron bunching with the analysed(proposed) method of magnetic field line application.A qualitative comparison is shown for efficiency through the same slow wave structure, guided by a uniform axial magnetic and the proposed periodic magnetic field.Efficiency enhancement of nearly 20% is observed in case of periodic magnetic field.

Research Publications:-

(1) Tusharika S. Banerjee, K.T.V. Reddy, and ArtiHadap, 'Review on Microwave Generation Using Backward Wave Oscillator', Scholars Research Library Archives of Applied Science Research ISSN: 0975-508X Vol. 6.,No.4,pp. 129-135,August, 2014.

(2) Tusharika S. Banerjee,A Hadap, KTV Reddy, TS Banerjee, 'Electromagnetic Wave theory for Calculation of Exact Magnetic field in case of BWO' , Engg. Journals, J. of Electrical and Electronic Sys. ISSN: 2332-0796 Vol. 11.,No.11,pp. 1000173,February,2016.

(3) Tusharika S. Banerjee, ArtiHadap and KTV Reddy, 'Understanding the focusing of charged particle for 2D sheet beam in cusped magnetic field, ', Under Accelelarator Physics section, Cornell University Library, arXiv: 1607.02492,July 2016.

(4) Tusharika S. Banerjee,ArtiHadap, KTV Reddy, 'Analysis of High Current Sheet Beam Transportation', Engg.Journals,Research India Publications,International Journal of Electronics Engineering Research, ISSN: 0975-6450 Vol.9,No.8,pp. 1245-1258,August 2017.

(5) Tusharika S. Banerjee,AyushSaxena,ArtiHadap, KTV Reddy, 'Design and Performance Improvements in an A6 Relativistic', Universal Journal of Electrical and Electronic Engg ., Horizon Research Publishing Corporation, ISSN: 2332-3280 Vol.6,No.3,pp. 115-128, July 2019.

(6) Tusharika S. Banerjee,AyushSaxena,ArtiHadap, KTV Reddy, 'Particle-In-Cell Simulation of a RBWO with Experimental Voltage Input Pulse and External Magnetic Field ', Physics Open, Elseveir , ISSN 2666-0326 Vol.100015,No.3,pp. 1-4, February 2020.

(7) Sheet Beam Driven Metamaterial based Backward Wave Oscillator, Accepted at IEEE International Conference on Plasma Sciences-2020 for full paper presentation, Nuclear Plama Sciences Society-NPSS ,ICOPS- 2020.

(8) Enhanced efficiency of C-band Sheet Beam Driven Backward Wave Oscillator Guided by Periodic Magnetic Field, Accepted at Microwave and Optical Technology Letters, Wiley Publications, August-2020.

(9) Effect of Non-Uniform Magnetic Field on the Performance of a High-Power Sheet Beam Driven Backward Wave Oscillator, Communicated to IEEE Transactions on Electron Devices, September-2020.

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Title of the Thesis: Parameter Optimization of Wireless Sensor Networks using Mixed-Mode Logic

Abstract:

Though in WSN, processor consumes more power, next to processor ADC consumes more power. So it is required to optimized a parameter(s) of WSN in order to reduce the power consumption by ADC. This report presents a 10-bit mixed current-mode low power SAR ADC for sensor node application. The different entities of a successive approximation register (SAR) analog-to-digital converter (ADC) circuit has a mixed-mode approach which includes voltage-mode regenerative comparator; mixed SAR logic; and current-mode digital-to-analog converter (DAC). The performance limitation of speed and the kick-back noise of a dynamic comparator is resolved using duty cycle controlled regenerative comparator. A mixed-mode logic of a SAR is partitioning the design into synchronous ring counter and asynchronous output register. The data shifting of a ring counter is with the common clock tick while the output register exchanged it asynchronously using handshake signals, resulting in a low power SAR. The current-mode switching function is used in a DAC reduces the asynchronous switching effects by achieving a differential and integral nonlinearity +0.67/-0.58, and +0.82/-0.86, respectively. In overall, the mixed SAR ADC consumes a 41.6 μW power and achieves an SFDR 69.3 dB with an energy efficiency of 16.83 fJ/conversion-step achieved at 10 MS/sec and 1 V supply voltage. It is designed and simulated in the 0.18μm TSMC CMOS process.

Research Publications:-

[1] D. Marathe and U. Khot, "A 1-V 10-bit 16.83-fJ/Conversion-step Mixed Current Mode SAR ADC for WSN," Int. J. of Image, Graphics and Signal Processing (IJIGSP), MECS Press, vol. 11, no. 11, pp. 43-50, Nov. 2019. DOI: 10.5815/ijigsp.2019.11.06

[2] D. Marathe and U. Khot, "A Systematic approach to determining the duty cycle for regenerative comparator used in WSN," Int. J. of Electronics and Telecommunication (JET), vol. 65, no. 2, pp. 329-333, Apr. 2019. DOI: 10.24425/ijet.2019.126318
[3] D. Marathe and U. Khot, "A 10-Bit 10-MS/s 5.72 nW Mixed SAR Logic for ADC used in Wireless Sensor Node," in Proc. 3rd IEEE ICNTE Conf., Vashi, India, 2019, pp. 1-6. DOI: 10.1109/ICNTE44896.2019.8946000
[4] D. Marathe and U. Khot, "An Optimized Successive Approximation Register used in ADC for Wireless Sensor Nodes," Indian J. of Science and Technology, vol. 9, no. 44, pp.1-6 , Nov. 2016. DOI: 10.17485/ijst/2016/v9i44/102877.

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Title of the Thesis: Current-Mode Techniques for Optimizing the Parameters of Mobile Communication Systems

Abstract:

In existing communication system the research is going behind making an efficient transmitter and receiver from bandwidth and power consumption point of view. This research deals with development of efficient techniques for optimizing bandwidth and power consumption in communication system. The use of CurrentMode (CM) devices in communication system will help in reducing the power consumption. The initial part of the thesis discusses the various current-mode devices in brief. Looking at the advantages of Current Feedback Operational Amplifier (CFOA) over other CM devices, the research is executed by designing the transmitters and receivers using the CFOA. This research presents a MOSFET based Current Feedback Operational Amplifier (CFOA). The CFOA designed is composed of translinear loop and current mirrors. This CFOA is operated at low supply voltage of ±1 V with bandwidth (-3 dB) of 106 MHz at value of input resistance Rx as 50 Ω. This CFOA is verified as inverting amplifier for different values of gain. Further, by employing a DC current injection technique at node x, the input resistance Rx of CFOA is reduced which in turn increases gain and bandwidth to 24.12 dB and 169 MHz, respectively. The proposed CFOA along with current injection technique can be suitable for radio frequency analog structures such as filters, oscillators, transmitters, and receiver circuits. The CFOA is simulated in the standard 0.18 μm CMOS TSMC technology with minimal count of CMOS transistors. The simulation result exhibits the parasitic resistance reduces to 10 Ω at node x. With this current-mode CFOA using current injection technique, Frequency Shift Keying (FSK)

transmitter and receiver required for communication system have been designed and simulated. The communication system using CM technique shows 39.39% reduction in power consumption compared to the one in Voltage-Mode (VM) technique i.e. from 15.32 mW in VM to 9.2 mW in CM. The same communication system has been implemented using conventional AD844 in VM and CM and shows 43.07% reduction in power consumption in CM compared to VM i.e. from 3.32 W in VM to 1.89 W in CM.

The Bit error Rate is also the lowest in case of the current mode transceiver which is 1*10-3. The process technology used in proposed CFOA, FSK Transmitter ix and Receiver is comparatively smaller or same than the reported data in order to achieve compactness and lesser power dissipation.CFOA designed using minimum number of MOSFETS gives substantially low power dissipation than the reported data.The input resistance value is much smaller than the reported data. Also the bandwidth achieved is substantially higher than the reported data. In one of the reference paper the CMOS fully differential current feedback operational amplifier with controllable -3dB bandwidth which is around 57MHz, but in proposed work it is reaching upto106.25MHz which is discussed in section 3.4. As the supply voltage is at the higher end (±3.8V) the power dissipation in the BJT based paper is high (40 mWatts) compared to other related work. The less power dissipation and reduction in Rx highlights the strengths of the proposed CFOA. The proposed work provides higher bandwidth than the other low power CFOA.

The FSK Receiver designed using minimum number of CFOA gives substantially low power consumption than the reported data. The Power Consumption is significantly influenced by the analog performance parameters of the device technology. Considering the nanometer CMOS technology, here an attempt is made to reduce the power consumption of the FSK receiver. The power consumption in the proposed FSK receiver is 9200 μW which is lesser than the reported data. Considering the Power Consumption of the FSK Transmitter is significantly less as compared to the references papers. So the proposed work already indicates that using current mode technique we can achieve optimization of the performance parameters in communication systems.

Research Publications:-

Journal Publications:

[1] N. A. Bhagat and U. P. Khot, “Current Mode Current Injection Technique for Gain and Bandwidth Enhancement for Novel CFOA”, IOSR J. VLSI and Signal Processing (IOSR-JVSP), vol. 9, no. 3,ser. I, pp. 01-10, e-ISSN: 2319 – 4200, p-ISSN No.: 2319 – 4197, May-Jun. 2019.

[2] U. P. Khot and N. A. Bhagat, “Current Mode Based Communication System”, Int. J. Innovative Research in Electrical, Electronics, Instrumentation and Control Engg., vol. 3, no. 3, Mar. -2015. DOI: 10.17148/IJIREEICE.2015.3301

Conference Publications:

[1] N. A. Bhagat and U. P. Khot, “Voltage-Mode and Current-Mode FSK Demodulator using IC AD844 at Circuit Level”, in Proc. IEEE 5th Int. Conf. Convergence in Technology, Pune (MS), India, 29th - 31st Mar. 2019, pp. 01- 04.

[2] P. Fakatkar, N. A. Bhagat, and U. P. Khot, “Low Power Current-Mode Frequency Shift Keying (FSK) Transmitter”, in Proc. Int. Conf. on Computing and Communications Technologies (ICCCT), Sep. 2015, India. ISBN: 978-1- 4503-3552-2. DOI: http://dx.doi.org/10.1145/2818567.2818680.

[3] A. Faheem, N. A. Bhagat, and U. P. Khot, “Current-Mode Full Wave Rectifier Topology for Integration”, in Proc. 3rd IEEE Int. Conf. on Recent Trends in Electronics, Information Communication Technology, 2018, ISBN : 978-1- 5386-2440-1/18.

[4] A. Faheem, N. A. Bhagat, and U. P. Khot, “Design of Low Voltage Supply Current Feedback Operational Amplifier”, in Proc. IEEE 2nd Int. Conf. on Inventive Communication and Computational Technologies, 2018, ISBN: 978- 1-5386-1974-2.

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Title of the Thesis: Emotion recognition using facial expression

Abstract:

Emotion detection using facial expression requires efficient representation of facial images. The efficiency of facial expression recognition depends on discriminative characteristics of features that describe facial expressions efficiently. Facial expressions are extremely dynamic in nature. The dynamics of facial muscle changes is required to be captured and encoded accurately. The combination of active appearance based feature model and geometric based feature model is proposed for accurate representation of expressive facial images. We consider bags of features consisting of local features and global features. The proposed
feature descriptor encodes local appearance and global characteristics of facial region. Local feature descriptor includes LBP histogram feature and HOG features. Global features include projection features and active shape features using facial landmark points. The LBP histogram features captures optical changes of face region where as HOG features captures directional orientation on local region. Projection features captures expressive edges due to internal emotional state of mind. Facial point feature descriptor captures shape feature. Energy efficient feature extraction is obtained by performing multi-resolution decomposition of feature vector using two level Discrete Wavelet Transform. Low frequency band coefficients which constitutes more than 80% of total energy, are taken as feature vector to describe face image. High frequency wavelet coefficients are discarded as energy content is less than 20%. This also reduces the dimension of feature vector by 50%. The fusion of energy efficient local and global features using Neural Network describes facial image efficiently. The accuracy of recognition is improved by increasing the strength of feature descriptor. For efficient classification, we defined class specific salient patches on face region and the feature vector of salient patches are used as a booster to the training set. The energy efficient optimum hybrid handcrafted feature descriptor is classified into six emotions using Support Vector Machine which are broadly classified into positive emotions and negative emotions. FER using feature level fusion outperformed decision level fusion classification strategy. We used Cohn-Kande database(CK-FED) to compare the performance with the state of the art published resent techniques. FER algorithm is tested on the standard databases such as Japanese Female Facial Expression Database(J-FED), Taiwanese Facial Expression Database(T-FED), Karolinska

Directed Emotional Faces Database(KDEF), different age groups FACES Database(FACES) and locally developed Indian Facial Expression Database(I-FED). The proposed FER model based on energy efficient handcrafted boosted hybrid feature descriptor produced efficiency of 99.18% on CK-FED dataset for six class emotion recognition.

Research Publications:-

Journal Paper:

[1] KiranTaleleDr.KushalTuckley, "Facial Expression Recognition using Digital SignatureFeature Descriptor" Signal, Image and Video Processing, Springer Nov-21, 2019.

Conference Paper:

[1] KiranTaleleDr.KushalTuckley, "Human Action Unit Detection of Patient using Geometric Feature Analysis", IEEE TENCON 2016- Technologies for Smart Nation, 22nd-25thNov, 2016,Marina Bay Sands, Singapore.
Web-link : https://ieeexplore.ieee.org/document/7848408

[2] KiranTalele and KushalTuckley, "Facial Expression Classification using Support VectorMachine Based on Bidirectional Local Binary Pattern Histogram Feature Descriptor", at 17th
IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Net-working and Parallel/Distributed Computing (SNPD 2016), May 30 - June 1, 2016, Shanghai,China.
Web-link :https://ieeexplore.ieee.org/document/7515888

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Title of the Thesis: Design of Compact Electromagnetic Band Gap Structures for Enhancement of Microstrip Patch Performances

Abstract:

In wireless communication, a compact and wideband microstrip antennas are preferredmainly due to its size and cost. To get compact microstrip antennas, several approacheshave been reported. One of the simplest way commonly used to reduce the size of microstrip antennas is to increase the dielectric constant of the substrate. But by increasingdielectric constant microstrip antennas performances get reduced due to surface wavespropagation in the substrate. This Surface waves can be reduced by using Electromagnetic Band Gap (EBG) structures with microstrip antennas. In this thesis, we havedesigned compact single band gap, dual band gap, and polarization dependent EBGstructures to enhance the performance of microstrip antennas. Application of each proposed EBG structure in microstrip antenna are demonstrated which proves that proposedEBG structures are useful in antenna community where compact size is highly desired.

Research Publications:-

Journal

(1) Pramod P. Bhavarthe, Surendra S. Rathod, and K. T. V. Reddy, “A Compact TwoVia Slot Type Electromagnetic Band Gap Structure," IEEE Microwave and WirelessComponents Letters, vol. 27, no. 05, pp. 446-448, May 2017.

(2) Pramod P. Bhavarthe, Surendra S. Rathod, and K. T. V. Reddy, “A Compact Two ViaHammer Spanner type Polarization Dependent Electromagnetic Band Gap Structure,"IEEE Microwave and Wireless Components Letters, vol. 28, no. 04, pp. 1-3, April 2018.

(3) Pramod P. Bhavarthe, Surendra S. Rathod, and K. T. V. Reddy, “A Compact Dual-Band Gap Two Via Double Slot Type Electromagnetic Band Gap Structure," IEEETransactions on Antennas and Propagation, vol. 67, no.1, January 2019.

International Conference

(1) Pramod P. Bhavarthe, Surendra S. Rathod, and K. T. V. Reddy, “Mutual CouplingReduction in Patch Antenna Using a Two Via Slot Type Electromagnetic Band GapStructure for IOT Application," IEEE International Conference on Communication, Information and Computing Technology (ICCICT-2018), 2-3 Feb. 2018, S.P.I.T., Andheri,Mumbai.

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Title of the Thesis: Hardware-in-the-Loop Test-Bench for Resonant Inverter Load Characterization

Abstract:

An implementation of a fully digital control system for driving resonant power converters is a challenging task. Further, solving discrete-time equations on a digital platform like FPGA device being used for its fast response characteristic along-with the real-time validation is an additional challenge. This research work aims at solving both the challenges by developing a Hardware-in-the-Loop (HIL) platform for resonant inverter based systems, with three case studies: Induction Heating system, DC-DC converter and Battery Charging system, each exhibiting different load characteristics.

A hybrid control strategy is proposed that uses Phase Shifted - Pulse Width Modulation for output parameter regulation (power, voltage or current) and Pulse Frequency Modulation control to maintain soft switching for dynamic load conditions, simultaneously for the above case studies with an unified approach. In addition, to meet the relevant IEEE standards for power quality improvement, unity power factor is maintained in both, single-phase and three-phase battery charging systems using a Dead-Beat current control method and synchronous reference frame theory, respectively. HIL simulation test-benchis proposed to validate these control strategies, with its discrete-time controller implementation on the FPGA platform, in real-time. The closed loop performance of the controller is investigated under different parametric conditions. An improvement in the overall control performance is achieved by newly proposed dynamic slope compensation logic. Time-domain analysis is carried out for these systems to investigate the relationships and trade-offs between different input-output control variables. Further, simulation based modelling of the control system and different PID tuning methods are presented to validate the stability of the proposed control structure and reduce the design time of the control system. An experimental test was carried out on a laboratory prototype of 5 kW induction heating system for metal melting applications, using Zynq-XC7Z020-1clg484 FPGA platform. The experimental results closely match with the HIL simulation results; this validates the feasibility of the proposed discrete-time controller and the effectiveness of its implementation method on the FPGA platform. The proposed HIL test-bench is a useful platform for rapid development and real-time validation of controllers for resonantinverter based industrial power electronic systems as well as rapid prototyping of application specific integrated circuits.

Research Publications:-
Journal

(1) Darshana N. Sankhe, Rajendra R. Sawant, and Y. S. Rao, "FPGA-Based Hybrid Control Strategy for Resonant Inverter in Induction Heating Applications," in IEEE Journal of Emerging and Selected Topics in Industrial Electronics, vol. 3, no. 1, pp. 156-165, Jan. 2022, doi: 10.1109/JESTIE.2021.3051584.

(2) Darshana N. Sankhe, Rajendra R. Sawant, and Y. S. Rao, "Hardware-in-the-Loop Simulation of Induction Heating System for Melting Applications Using Xilinx System Generator," in Advances in Intelligent Systems and Computing, vol. 1272, 2021, Springer, Singapore.

(3) Darshana N. Sankhe, Rajendra R. Sawant, and Y. S. Rao, "Implementation of Harmonic Oscillator Using Xilinx System Generator," in Advances in Intelligent Systems and Computing, vol. 941, 2020, Springer, Cham.

Conference

(1) Darshana N. Sankhe, Rajendra R. Sawant, and Y. S. Rao, "Overview of Power Hardware-in-the-Loop Simulation Towards Implementation of Digital Controller for Resonant Inverters," in IEEE International Conference on Micro-Electronics and Telecommunication Engineering, ICMETE, 2018, pp. 6-11,doi: 10.1109/ICMETE.2018.00015.

Patent

(1) Darshana N. Sankhe, Rajendra R. Sawant, and Y. S. Rao, "System-on-Chip Controller for On-Board Battery Charger in 2 and 3 Wheeler Electric Vehicle Applications," Indian Patent Published on 16-07-2021, awaiting final examinat**ion.**

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Title of the Thesis: Medical Image Enhancement and Abnormality Detection

Abstract:

Healthy cells in the organ begin to alter and get intractable to form a mass known as a tumour, which is how cancer starts. A tumour may be benign or malignant. Since early tumour detection is indispensable for ensuring recuperation, ultrasound modality for the diagnosis of uterus tumours or fibroids continues to stand out as one of the most viable image-capturing techniques. This is because it is frequently used in medical field to image soft tissues in organs like liver, kidney, spleen, uterus, heart, and brain. Ultrasound scans are safer and more affordable, as compared to MRI scans and biopsies. However, they have the drawback of having lower resolution and supplemental noise.

Subsequently, ultrasound images just as machine output are not suitable for applications where precision and efficiency are pivotal. However, ultrasound image quality shall be improved by respective image processing steps, such as strong denoising, image enhancement, segmentation, and feature extraction methods. Ultrasound images can reach even higher accuracy, cementing them as plausible alternatives to superior medical images. Images get corrupted with noise during acquisition, transmission, reception, storage and retrieval process. Digital image filters are developed to denoise such corrupted images. Complete removal of noise is an impossible task. Along with other random noises such as Gaussian, Impulse commonly occurring noise in medical image is grainy speckle which is multiplicative in nature. Medical images are incredibly complicated as they are noisy in nature. For the therapeutic interventions, the image must be absolute clear with lowest contamination possible. Numerous effective filters are suggested in the literature to reduce speckle noise. However, as noise density increases, their performance deteriorates. Speckle noise removal methods include median, Wiener, and various diffusion-based filtering methods. Out of them, an-isotropic diffusion (AD) or nonlinear diffusion (ND) can reduce the speckle commotion in clinical pictures while assuring and strengthening the outlines in ultrasound images. In any event, using a particular diffusion filter or median-based algorithms to accurately minimise the speckle commotion is challenging in perception of the granular dot commotion. So, it is necessary to design some combinational filters. Throughout the recent investigation research, efforts are made to suggest effective channels that reduce

the speckle noise along with other nonlinear types of noise and maintain the edges and fine details of an image with the maximum resolution feasible, in a wide range of noise densities. The literature makes it apparent that super resolution is required after filtering in order to attain greater performance than filtering alone. Therefore, the filters that are suggested in this thesis are based on filtering subsequently Super Resolution approaches.

The outcomes of employing the hybrid filters and SRCNN approach together to create real-time ultrasound images have improved visual consistency and less artefacts. Therefore, the proposed resolution enhancement system greatly reduces contamination considerably more efficiently even at noise densities as high as 80 percent while perfectly preserving image details.

This research specifically based proposed hybrid filters, followed by application of Super-Resolution (SR) on these filtered and segmented medical pictures of ultrasound imaging modality. Combined technologies like filtering, resolution enhancement helps in the detecting the abnormality if any present in the image. The Grey Level Co-occurrence Matrix (GLCM) and Discrete Wavelet Transform (DWT) are used to extract textural features. With the help of several machine learning approaches, such as Support Vector Machine (SVM), K-Nearest Neighbour (KNN), and Random Forest classifiers (RFC), the extracted characteristics are immediately sent to classifiers to classify uterus tumours from ultrasound images between benign and malignant. Thus, the objective of producing superior ultrasound clinical images from low-cost, low-resolution modalities and detecting uterus tumour has been successfully achieved, leading to better accuracy of 97.8% using RFC.

Research Publications:-

Journal Publications

[1] AshwiniSawant, SujataKulkarni, "Ultrasound Image Enhancement using Super Resolution", Biomedical Engineering Advances, Volume 3, 100039, ELSEVIER Journal, June 2022.https://doi.org/10.1016/j.bea.2022.100039

[2] AshwiniSawant, SujataKulkarni, "Performance Analysis of Medical Image Denoising Techniques", published in Lecture Notes in Networks and Systems book series (LNNS, volume 300) by SPRINGER, Indexed in SCOPUS, Google Scholar, 2021. http://dx.doi.org/10.1007/978-3-030-84760-9 15

[3] Ashwini Sawant, Sujata Kulkarni, "Hybrid Filtering Techniques for Medical Image Denoising", Published in SSRN, open-access online preprint community, owned by Elsevier, 2020.http://dx.doi.org/10.2139/ssrn.3713772

Conference Publications

[1] Ashwini Sawant, Sujata Kulkarni, "Performance Analysis of Medical Image Denoising Techniques", Second International Conference on Image Processing and Capsule Networks (ICIPCN 2021), King Mongkut's University of Technology Thonburi, Thailand, pp 156–166, 27 – 28th May 2021.

[2] Ashwini Sawant, Sujata Kulkarni, "Hybrid Filtering Techniques for Medical Image Denoising", International Conference on Business Management, Innovation and Sustainability (ICBMIS-2020), Amity University, Dubai, 15thJune2020.

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Title of the Thesis: Modeling Software Solutions leveraging Soft Computing Techniques to improve Business Process Agility

Abstract:

Enterprise solution gives a standardize structure for collecting information from different modules and then processing it as per the organizational policy. To improve business knowledge as per changing environment, an organization needs to redefine and fine-tune development of it's business processes following all infrastructure quality. Changing environment can generate information as per the expert's perspective or as per different organization's business policy structure. Hence it can be incomplete or non-standard. Due to ever-changing requirements of enterprise solution, handling agile environment is the current problem in the IT industry. Information received in the agile environment is not clear or it can be imprecise. Hence enterprise solution face a problem in modification of its structure. Understanding detail structure of the different levels in architecture with its incomplete or linguistic information depends on the organization's perspective. Handling this uncertainty in the application is the upcoming problem in the organization who are handling enterprise solution. Process of agility requires a new way of planning, organizing, operating, and controlling the business in changing environment. To manage this unpredictable business environment, soft computation's conceptual based techniques can be implemented. This techniques combines its smoothness and embedded empirical qualitative knowledge. Soft computing techniques handles imprecise, uncertain condition rather than traditional computing techniques. Modeling software solution using soft computing techniques may stage or manage the business process agility of an enterprise. Imprecise information can be handled using classification, or rule base or by selection of optimized solution from the set of solution. Different soft computing techniques in it's soul or in hybrid approach can also combine their effects to measure business process agility of the different modules of the enterprise solution

Research Publications:-

Patent

(1) Patent Name: Theoretical concept of ”business process framework in an enterprise architecture as per the architectural level” Registered on 31st May 2016 Registered in THE PATENTS ACT, 1970 Mumbai (39 of 1970)

Journal Publications

1. Paper Title: Soft Computing Approach for Measuring Business Process Agility in an Agile Environment Published in: International Journal of Computer Applications (0975 8887) Volume 168 Number 11, Paper Reference ID: 2017914534 Publication Month: June 2017 ISBN: 973-93-80896-69-1 DOI: 10.5120/ijca2017914534.
2. Paper Title: Agile Parameter Affecting Supply Chain Management Strategy Published in: International Journal of Supply Chain Management ISSN: 2050-7399 (Online), 2051-3771 (Print) Publication Month: Vol 6, No 4 (Dec. 2017).
3. Paper Title: Weight Assignment Algorithms for Designing Fully Connected Neural Network Published in: International Journal of Intelligent Systems and Applications (IJISA) Open Access ISSN: 2074-904X (Print), ISSN: 2074-9058 (Online) Published By: MECS Publisher, h5-index IJISA has been included in Scopus (Elsevier)
4. Paper Title: Selection of Enterprise Architecture Based on Agile Parameter For SCM based case study Published in: Scholedge International Journal of Business Policy & Governance ISSN 2394-3351 MIAR ICDS Rank: 5.5 (2017) Publication Month: Vol. 4 No. 5 (2017) DOI: 10.19085/journal.sijbpg040501

Conference Publications

1. Paper Title: Business Process Analyzed factors affecting Business Model Innovation Organizing College: Fr. C. Rodrigues Institute of Technology, Vashi, Mumbai Published in: Nascent Technologies in the Engineering Field (ICNTE), 2015 International Conference on Date of Conference: 9-10 Jan. 2015 Date Added to IEEE Xplore: 05 February 2015 INSPEC Accession Number: 14904331 DOI: 10.1109/ICNTE.2015.
2. Paper Title: Selection of optimal services working on SCM strategies using Fuzzy decision making methods Organizing College: ABES Engineering College, Ghaziabad Published in: Computational Intelligence & Communication Technology (CICT), 2016 Second International Conference Date of Conference: 12-13 Feb. 2016 Date Added to IEEE Xplore: 18 August 2016 INSPEC Accession Number: 16232778 DOI: 10.1109/CICT.2016.97
3. Paper Title: Solving enterprise solution complexity in SCM domain through Business process agility Organizing College: VallurupalliNageswararaoVignanajyothi Institute of Engineering and Technology Hyderabad Published in: 7th IEEE International Advance Computing Conference (IACC-2017) Organized by IEEE Computer Society Chapter of India Council Date of Conference: 5th 7th Jan 2017 Date Added to IEEE Xplore: 13 July 2017 205 Electronic ISSN: 2473-3571 INSPEC Accession Number: 17030530 DOI: 10.1109/IACC.2017.0187

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Title of the Thesis: Seamless Integration of Applications on Mobile Cloud using Hybrid Approach

Abstract:

The world has changed a lot in the past couple of decades, technology has led to great new innovations that have disrupted a lot of systems. Mobile is a great example of this. Over the years, fitting the computer in your hands has become a reality because of the amazing feats in technology. Mobiles are small computers that can process huge amounts of data within fractions of seconds. Over the years, software developers have designed countless applications to make our life easier by using this great computational power of mobile phones. Day by day mobile applications and mobile devices increasing rapidly. Still many of the applications do not perform well due to the limited resources of smart mobile devices. Most of the applications are specific to platform i.e. they are not interoperable, portable and transferable. Due to this there is need to achieve "Write Once, Run Everywhere "principle. This principle can be achieved using integration of application on mobile cloud computing using hybrid approach seamlessly.

Research Publications:-

1. Kailas K. Devadkar, Dhnanjay R. Kalbande, "Partitioning Android mobile application for improving execution time " 2015 IEEE International Conference on Research in Computational Intelligence and Communication Networks (ICRCICN) , Date of Conference: 20-22 Nov. 2015 , DOI: 10.1109/ICRCICN.2015.7434277 , Date Added to IEEE Xplore: 17 March 2016
2. Kailas K. Devadkar, Dhnanjay R. Kalbande , "Comparison of Execution Time of Mobile Application Using Equal Division and Profile-Based Algorithm in Mobile Cloud Computing" Springer Nature Singapore Pte Ltd. 2020,Microservices in Big Data Analytics, https://doi.org/10.1007/978-981-15-0128-9 6
3. Nikhil Dange, Kailas Devadkar, DhananjayKalbande, "Scheduling of task in collaborative environment using mobile cloud " International Conference on Global Trends in Signal Processing, Information Computing and Communication (ICGTSPICC), date of conference 22-24 Dec. 2016, Date Added to IEEE Xplore: 26 June 2017, DOI: 10.1109/ICGTSPICC.2016.7955367

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Title of the Thesis: Affective State Learner Model in Virtual Learning Environment

Abstract:

This thesis deals with determination of affective state learner model in virtual learning environment. During a learning activity, the learners may experience emotions like confusion, confidence, happiness. These emotions arise naturally as a response of the understanding of the learnt content. The positive, pleasant emotions arise when learner grasps the leaning contents well. Lower understanding of learning content can give rise to negative feeling in learner's mind. Typically, learning centered emotions are confidence, happiness, confusion, frustration, boredom etc. These emotions are known as learner affect. Having positive learning affect is always desired. In virtual learning systems where learning happens with the system as teacher; it is desirable that the learner affect is determined by the system. This can act as feedback of learner affect to the system. The system can know more about the learner emotion. The learning system with capability of determining learner affect is affective learning system. There is a needfor identifying the learner affect in virtual learning systems. Many existing learning management systems have all functionalities of providing learning contents to the learner. But determination of learner affect and creation of affective learner profile is a need of time. Some learning systems have affective learner model via facial expression analysis. Such systems find out learners affect by continuous monitoring of learner's face via camera input. But these systems require a lot of network bandwidth as well as they are intrinsically intrusive in nature. The learning experience may be hindered due to continuous monitoring of the learner. There are other systems which are based on brain activity with physiological sensors attached to the body The system analyses the changes in the physiological signals to determine the emotion. Such systems are intrusive, costly and uncomfortable to the user. They work well only in laboratory setup. It would be preferable to recognize the learner affect on the basis of interactions of thelearner with the system during learning activity. A virtual learning system has learning content component and examination component. When a learner uses the learning system, the learner interacts with these components. The log of learner interactions can be created in the system in the form of various parameters like time, difficulty level, hint, help seeking behaviour, correctness etc. Learning psychology theories indicate a strong relationship between emotion and the executed behaviour.Thebehavioural interactions of the learner with system are expressions of emotions of the learner. These interactions are unique to the learner. They convey of his/her learning affect. They are indicative of the underlying affective state. We need a learning system which maintains record of such behavioural interactions. We establish the development of affective learning system on well-known education technology theory, Bloom's Taxonomy. Cognitive domain refers to knowledge and development of intellectual skills of the learner. The affective learning system is designed on the premise of Bloom's

Taxonomy's cognitive domain. The cognitive domain represents the learning and thinking process of the learner in terms of remembering facts, systematic patterns and conceptual understanding. The learning activity of the learner in virtual learning is associated with learning and understanding the contents. The learner exhibits his/her understanding while attempting the test. From the description of Bloom's Taxonomy and virtual learning activity, we hypothesize that cognitive domain is most suitable domain to determine learners affect. The various levels in cognitive domain directly relate with learners expression of understanding. The affective states which are of critical importance in the context of learning are Confusion and Confidence. Confusion and Confidence are the emotions which are most commonly expressed by a learner. Confusion is said to be present when the learner exhibits few or all of the listed characteristics such as poor comprehension of learnt material, attempts to resolve erroneous belief, display of lack of understanding and a state of disorder and is unsure what and how to go next. The typical characteristics displayed by confident learner are interest in studying, exhibiting the understanding, able to verbalize the learnt content, able to solve questions with clarity, showing regularity in attendance, and achieving good grades. From this, we define the affective states confusion and confidence in terms of interaction patterns of the learner with respect to performance at the cognitive level questionnaire in the test.

The affective learning system captures interaction pattern of the leaner during learning activity. It generates the dataset for further analysis of the affective state learner. The analysis techniques are established by the authors for the affective state determination.

The thesis further discusses the methodology to create an Adaptive Learning System from Affective Learning System. The learning system adapts to the confidence affective state by posting more difficulty level learning material to the learner. The system adapts to the confusion affective state by less difficulty level learning material to the learner. Thus affective state acts as feedback to the system about the understanding level of the learner. With more and more dependency of human beings on virtual world, for many activities from governance to banking to learning; having feedback of the user emotions to thesystem is highly desirable and wise. The research presented in this thesis is one such step towards more sensitive and responsive virtual learning system.

Research Publications:-

Conference Publications

(1) Kavita Kelkar and Dr J W Bakal, ”Behavioral Feature Analysis For Learner Affect Identification,IEEE 16th India Council International Conference (INDICON), December 2019.

(2) KavitaKelkar and Dr J W Bakal, “Random Forest Algorithm for Learners Confusion Detection Using Behavioral Features,Springer International Conference onMobile Computing and Sustainable Informatics, January 2020.

(3) Kavita Kelkar and Dr J W Bakal, “Hyper Parameter Tuning of Random ForestAlgorithm for Affective Learning System, IEEE Third International Conferenceon Smart Systems and Inventive Technology (ICSSIT), August 2020.

(4) Kavita Kelkar and Dr J W Bakal, “Positive reinforcement in virtual learning systems through gamification of adaptive MCQ test, ICICNIS 2021, SSRN digital library, June 2021.

Journal Publications

(1) Kavita Kelkar and Dr J W Bakal, “Design of Cognitive MCQ test in VirtualLearning Systems to Determine Learner Affect”, International Journal of RecentTechnology and Engineering (IJRTE), ISSN: 2277-3878, January 2020.

(2) KavitaKelkar and Dr J W Bakal, “Adaptive MCQ Test Generation Based onAffective State Feedback, Journal of University of Shanghai for Science and Technology, ISSN:1007-6735, August 2020.

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Title of the Thesis: Machine Learning Enabled Keystroke Behavioral Analytics as a Support Factor for User Authentication

Abstract:

Keystroke dynamics, is a behavioral biometric technique that involves analysis of of typing style of an individual. A lot of work and research has been done on continuous and static keystroke dynamics for providing an acceptable level of accuracy in identifying a user through keystroke dynamics. In continuous keystroke dynamics, the system keeps capturing keystrokes of the user continuously and hence has enough information about the key usage of the user other than the timing features to build a model. As opposed to continuous keystroke dynamics, in static keystroke dynamics, a limited number of characters or keystrokes are available to build a model for the user based on his/her key usage. Other than key press and release timing the key usage is termed as non-conventional feature of keystroke dynamics. The research work here tries to explore if the non-conventional features of static keystroke dynamics can be used to authenticate the user during change of password when no timing information is available. In this research, the focus is on exploring this interesting domain and strengthens the static keystroke dynamics through additional feature set. The research work also focuses on how these additional features may be useful in scenarios like change of password. In order to showcase the usage, policy based model of capturing additional proposed features was also developed. In the process to test a repository of additional features was initiated.

Research Publications:-
Conference Publications

(1) Nataasha N Raul, RadhaShankarmani and Padmaja Joshi, “A Comprehensive Review of Keystroke Dynamics Based Authentication Mechanism”, Proceedings of Advances in Intelligent Systems and Computing, International Conference on Innovative Computing And Communication, vol 1059. doi.org/10.1007/978-981-15-0324-5 13, ISBN: 978-981-15-0324-5, pp 149-162, Springer Nature, Singapore, 2019.

Journal Publications

(1) Nataasha N Raul, RadhaShankarmani and Padmaja Joshi, “Non-Conventional Factors for Keystroke Dynamics as a Support factor for authentication user”, International Journal of Innovative Technology and Exploring Engineering, DOI: 10.35940/ijitee.D1194.029420, ISSN: 2278–3075, Volume-9, Issue-4, pp 474-479, February 2020.

(2) Nataasha N Raul, RadhaShankarmani and Padmaja Joshi, “Static Keystroke Dynamic Authentication (SKDA) Model to authenticate user while changing the password”, is under review International Journal of Applied Intelligence, Springer.

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Title of the Thesis: Imaging Techniques for Road Pothole Analysis

Abstract:

In the process of maintenance and assessment of roads, potholes are the major types of defects found on roads. The condition of roads plays an important role in the development of any country, being an essential section of the national infrastructure. Day by day this task is becoming very challenging. Potholes are major road defects which are commonly generated due to structure aging, large rainfall, dense traffic and thin or weak substructure, etc. Road defects assessment is to be done by collecting defects data and the analysis of that data. Currently, using various types of imaging systems data collection near about becomes automated, but an assessment of defects such as potholes from collected data is still manual. Manual methods are tedious, costly, and human error prone. There is always the risk that the rater's subjectivity and experience will influence the results. As a result, a system for automatic identification and assessment of potholes is required. In this thesis, a robust and efficient system is designed which detects potholes of various sizes, shapes, as well as textures and predicts its area based on the cutting-edge techniques of deep learning. The experimental results of classification between images of the road with potholes and without potholes and the computation of area of the detected potholes are demonstrated successfully. The system classifies pothole and non-pothole images with the highest accuracy of 89.66%. The overall computational accuracy of the areas of potholes is observed with an accuracy of 90% when compared to the actual measured area with ± 10% deviation. It is concluded that the results of the proposed methodology are encouraging. The knowledge and results of analysis drawn from the suggested method can also be used for cost estimation in road repair management.

Research Publications:-

Journal

[1] SurekhaArjapure and D.R.Kalbande, "Review on Analysis Techniques for Road Pothole Detection", International Conference on Soft Computing: Theories and Applications, Proceedings of SoCTA 2018, Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, Punjab, India,21-23 Dec. 2018, Advances in Intelligent Systems and

Computing book series (AISC, volume 1053,p.1189-1197) Springer 2020, DOI: 10.1007/978-981-15-0751-9_109.

[2] SurekhaArjapure, D.R. Kalbande, “Road Pothole Detection using Deep Learning Classifiers”, International Journal of Recent Technology and Engineering, ISSN: 2277-3878, Volume-8 Issue-6, March 2020, Elsevier Scopus Indexed, UGC DOI: 10.35940/ijrte. F7349.038620.

[3] SurekhaArjapure and D.R. Kalbande, “Deep Learning Model for Pothole Detection and Area Computation”, IEEE International Conference on Communication, Information and Computing Technology (ICCICT), Mumbai, India, 2021, pp. 1-6, DOI:10.1109/ICCICT50803.2021.9510073.

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Title of the Thesis: A Speech Model for Unvoiced Speech Recognition based onjElectroencephalography

Abstract:

Brain-computer interfaces (BCI) assist communication for the handicapped and disabled. Previous work has shown that it is usually non-intuitive and it frequently employs Electroencephalography (EEG) based motor imagery. The objective of the proposed research is to classify EEG data of covert speech words for intuitive BCI communication.

Extreme Learning Machine (ELM) with fast learning speed has been proven effective in classification applications and suitable for ensemble learning due to its randomness. Six subjects were asked to perform covert speech tasks i.e mental repetition of four different words i.e 'left', 'right', 'up' and 'down'. Kernel-based Extreme Learning Machine (kernel ELM) was used for multiclass and binary classification of EEG signals of covert speech words. The kernel ELM achieves significantly higher accuracy compared to some of the most commonly used classification algorithms in BCI. Our findings suggested that covert speech EEG signals could be successfully classified using kernel ELM.

Ensemble learning has been shown to be reliable in a variety of BCI classification tasks, including motor imagery and P300 event-related potential. The purpose of ensemble learning, according to past research, is to get trained accurate but diverse base classifiers to increase generalization performance. The suitability of ensemble methods for intuitive BCI communication using EEG data of different covert speech words is investigated in this work. To achieve this goal, we construct a random rotation based ELM ensemble, resulting in very diverse classifiers which can learn through transformed spaces. Minimize error ensemble pruning is used to prune low complementarity classifiers and consequently, combining the remaining high complementarity classifiers to get final ensemble classifier.

Eight subjects performed covert speech tasks which involved mentally repeating five words namely; 'left', 'right', 'up', 'down' and 'stop'. Our findings indicate the potential of random rotation kernel ELM ensemble pruning to effectively classify EEG-based covert speech signals. This proposed research involving an ensemble method for the classification of covert speech words can make a significant contribution towards intuitive BCI development using silent speech.

Research Publications:-

Journal Publications

(1) Pawar, D. and Dhage, S., 2020. Multiclass covert speech classification using extreme learning machine.Biomedical Engineering Letters, 10(2), pp.217-226.

(2) Pawar, D. and Dhage, S., 2020. Feature Extraction Methods for Electroencephalography based Brain-Computer Interface: A Review. IAENG International Journal of Computer Science, 47(3).

(3) Pawar, D. and Dhage, S., 2022. Wavelet-based imagined speech classification using electroencephalography. International Journal of Biomedical Engineering and Technology, 38(3), pp.215-224.

(4) Pawar, D. and Dhage, S., 2022. EEG-based covert speech decoding using random rotation extreme learning machine ensemble for intuitive BCI communication.Biomedical Signal Processing and Control, 80, p.104379.

Conference Publications

(1) Pawar, D. and Dhage, S.N., 2017, December. Recognition of unvoiced human utterances using brain-computer interface.In 2017 Fourth International Conference on Image Information Processing (ICIIP) (pp. 1-4).IEEE.

(2) Pawar, D. and Dhage, S.N., 2022. Imagined Speech Classification using EEG based Brain-Computer Interface. In 11 th International Conference on Communication Systems and Network Technologies (CSNT) (pp. 1-4). IEEE.

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Title of the Thesis: Design of metamaterial structure for triple band notch ultrawideband monopole antenna

Abstract:

In ultra wide band communication, designing of printed monopole microstrip antennas with multi-band notching characteristics have shown increasing interest to mitigate the electromagnetic interference between UWB systems and other co-existing narrow band systems. Traditionally, band notching with deformation on antennas was a common approach achieved on account of compromising with poor radiation characteristics and time domain behavior. By utilizing stop band characteristics of Electromagnetic Band Gap (EBG) structures as metamaterial, band-notching in UWB antennas can be obtained with improved performance parameters. Also, designing of Band notched UWB antennas bearing reconfigurable characteristics with least active devices is much desirable in order to overcome complex circuit biasing issues. In this research work, EBG is designed with triple band gap characteristics. Application of triple band gap EBG in UWB antenna to produce triple band notching characteristics is also presented. Moreover, embedding the EBG with varactor diode as active device, triple band notch tuning characteristics are also demonstrated. For wireless applications, presented UWB monopole antenna will prove to be a promising candidate wherein multi-band rejections using single EBG unit cell and tunability using one varactor diode is desirable.

Research Publications:-
Journals

(1) Vijay R. Kapure, Pramod P. Bhavarthe and Surendra S. Rathod,"A Switchable Triple-band Notched UWB Antenna Using Compact Multi-via Electromagnetic Band Gap Structure"Progress In Electromagnetics Research C, vol. 104, pp. 201-214, Aug. 2020.[Scopus Indexed, Citation = 7 as on date 16/08/2022]

(2) Vijay R. Kapure, Pramod P. Bhavarthe and Surendra S. Rathod,"Tunable Triple Band-Notched UWB Antenna using Single EBG and VaractorDiode"Progress In Electromagnetics Research C, vol. 110, pp. 181-195, Feb. 2021.[Scopus Indexed, Citation = 5 as on date 16/08/2022]

(3) Vijay R. Kapure and Surendra S. Rathod,"A Two Element UWB MIMO Antenna with Triple Band Notched Characteristics and High Isolation"Springer, Journal of Indian Academy of Science. [Under Revision since Aug. 2022.]

Conferences

(1) Vijay R. Kapure and Surendra S. Rathod,"A CPW fed UWB Band-notched Monopole Antenna Using EBG loaded superstrate" IEEE International Conference On Communication Information and computing Technology (ICCICT-2021), pp. 1-6, June. 2021., S.P.I.T , Andheri, Mumbai, India. [Awarded Best Paper]

(2) Vijay R. Kapure and Surendra S. Rathod,"A Multifunctional UWB Band-notched Antenna using PIN diode and Varactor Diode for Wireless Applications" IEEE Indian Conference On Antennas and Propagation (INCAP-2021), 13-16 December. 2021, MNIT Jaipur, Rajasthan, India.

Research Colloquium/Convention

(1) Vijay R. Kapure and Surendra S. Rathod,"Design of Metamaterial Structure for Triple Band-Notched UWB antenna" Participated and Presented poster in Research Colloquium in ICCICT-2021, S.P.I.T , Andheri, Mumbai, India. [Second Prize]

(2) Vijay R. Kapure and Surendra S. Rathod, participated and cleared selection round in the Engineering and Technology under Post-PG Category at the 15th University level research convention for project entitled "Design and Development of Tunable Band-Notched UWB Antenna using Single EBG and Varactor Diode", "AVISHKAR 2021.

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Title of the Thesis: Cross Domain Data Interoperability and Annotation using Semantic Web of Things

Abstract:

Nowadays, tremendous heterogeneous data has been generated, uploaded to, and downloaded from the Internet, it is becoming more and more popular. In the future, all applications will be connected to the Internet using recent technology such as the Internet of Things, machine learning, and artificial intelligence. The main problem of the current search engine is searching and retrieving accurate/precise relevant information from a huge database. There has been improvement attained in the past decade with the progress of search engine technologies, which process this information to retrieve relevant information in reply to users' query. However, users received most irrelevant information based on user query. A common reason for this is that presently used information retrieval models depend on keywords, and therefore deliver incomplete and irrelevant information. These models are incapable of defining relations between concepts or synonymy. A lot of efforts have been made to improve the performance of information retrieval systems. However, there is no specific standard method or uniform way to retrieve the best results. Cross-domain ontology construction receives little attention in research.
There is an increased need to retrieve the most relevant information efficiently and effectively.

Ontology plays a vital role in the semantic web technology to search information. Specifically, ontology design plays a crucial role in organizing, collecting, searching for, and retrieving machine understandable and meaningful information. Semantic web i.e. web 3.0 depends on the design of the ontology to provide meaningful information. Ontology design is considered as a challenging task. The goal of this thesis is to construct a new cross-domain ontology model for efficient information retrieval. The research work is mainly divided into two phases, data filtering and data annotation. First of all, in the data processing phase, The input data is pre-processed. After that, the proposed Jaccard similarity is evaluated to calculate the semantic similarity of every word. Next, the data is filtered using a semantic
similarity function. Further, the data is divided into wanted and unwanted words on the basis of the user's query. Unwanted words are nothing but outliers. Following that, semantic annotation is applied to selected data. Then, an ontology is constructed using optimization based clustering. In the clustering process, finding the optimal centroid is considered as a difficult task. The optimal centroid is the best search agent(best result). To overcome this issue, a new Circling Insisted Rider Optimization Algorithm is devised, which is hybridization of whale optimization and rider optimization. Further, inspired with the result of CI-ROA, Improved Sea Lion (ISnLO) is investigated to construct optimization based clustering to
improve search effectiveness. The constructed cross domain based ontology is tested and validated over other state of art models. Finally, a very detailed performance analysis by changing training percentage and cluster size with promising results are presented, obtained, and verified. The precision

of proposed ISnLO model at training percentage 70 and cluster size-3 is improved by EM clustering-30.86%, Semantic similarity-12.12%, and CI-ROA-5.85%. It performed better than other state of art models. The experiment results show proposed ontology construction models perform better than conventional models. The performance is measured using information retrieval metrics such as precision and recall. The results show that ontology construction time and execution time of proposed models using CI-ROA and ISnLO are reduced. For cluster size 2, training percentage 70, the ontology construction time using EM Clustering, Semantic Similarity, CI-ROA, and ISLnO are 4.04 X 10^{11}, 3.95 X 10^{11}, 3.62 X 10^{11}, and 1.31 X 10^{11} respectively. The conclusion is that the proposed optimization based clustering approach for ontology construction works as a solid base to retrieve relevant information using data filtering and data annotation problems.

Research Publications:-

1. Shital Kakad, Sudhir Dhage,"Cross domain-based ontology construction via Jaccard Semantic Similarity with hybrid optimization model," Elsevier, Expert Systems with Applications,Volume 178,2021,115046,ISSN 0957-4174,
2. Shital Kakad, Sudhir Dhage,"Ontology Construction: Perspective of Bio-Inspired Improved SeaLion Optimization Model for Cross Domain," Accepted, Springer, Evolutionary Intelligence
3. Shital Kakad, Sudhir Dhage," Knowledge Graph and Semantic Web Model for Cross Domain", Volume 100, Issue 16, Journal of Theoretical and Applied Information Technology, 2022
4. S. Kakad and S. Dhage, "Ontology Construction from Cross Domain Customer Reviews using Expectation Maximization and Semantic Similarity," IEEE 2021 International Conference on Emerging Smart Computing and Informatics
5. S. Kakad and S. Dhage, "Building Alumni Ontology to bridge Industry-Institute Gap using Protégé 5.5," IEEE 2021 2nd International Conference for Emerging Technology (INCET), IEEE 2021, pp. 1-6,
6. S. Kakad and S. Dhage, "Semantic Web: Knowledge Graph of Digital Minimalism Ontology," 2022 3rd International Conference for Emerging Technology (INCET), IEEE 2022, pp. 1-6, doi: 10.1109/INCET54531.2022.9824657.
7. S. Kakad and S. Dhage, "Semantic Web Rule Based Decision Support System: Knowledge Graph," IEEE, 2022 2nd International Conference on Intelligent Technologies (CONIT), 2022, pp. 1-6.
8. S. Kakad and S. Dhage, "Ontology Construction and Knowledge Graph for Cross Domain Unstructured Text," 2022 2nd Asian Conference on Innovation in Technology (ASIANCON), Ravet, India, 2022, pp. 1-4.

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Title of the Thesis: Design of Compact Monopole Antenna with Low Specific Absorption Rate using Metamaterial

Abstract: Wearable textile antenna used in various applications need novel designs to achieve objectives of compact antenna with lowest possible Specific Absorption Rate (SAR). In this research work, main goal is to design single and dual band wearable textile antenna suitable for Industrial, Scientific and Medical (ISM) band application, which is compact and has acceptable SAR. To start with, methods used to reduce SAR using Electromagnetic Band Gap (EBG) structure are briefly described. 5.8 GHz ISM band antenna is designed and modelled in Ansys High Frequency Structure Simulator (HFSS). SAR values with this antenna are computed in human body model. Effectiveness of EBG array structure to reduce SAR to acceptable values is demonstrated by simulations.

EBG of rectangular eight shaped at 5.8 GHz ISM band for wearable application is proposed. Basic objective is improvement of antenna impedance bandwidth. To achieve this, formation of EBG unit cell is in eight shape on outer ring. HFSS offers Eigen mode solution. It is used to simulate the eight shape EBG unit cell. EBG structure has been formed using designed unit cell. Validation of simulated results is carried out using experimental results. Inverse E-shape monopole antenna at 5.8 GHz with proposed EBG is demonstrated. Surface waves are reduced due to band stop property of EBG structure leading to reduction in back lobe. Due to high losses of RF energy into human body, frequency detuning of antenna occurs. This undesirable effect is eliminated by suitable design of EBG structure which also improves front to back ratio. The designed and tested compact antenna along with EBG shows impedance bandwidth of 5.60 GHz to 6.15 GHz. This range covers 5.8 GHz ISM band. Furthermore, as antenna is being used in wearable application, its performance under bending condition is tested. Values of SAR and their reduction on three layer body model is simulated to asses effectiveness of EBG array structure. SAR values computed in human tissue in 1 g and 10 g are both lesser than limits imposed by regulations. Thus, it is found appropriate to apply the proposed antenna in wearable applications.

The research work is progressed further by carrying out modelling, simulations and testing of dual band EBG structure. It is a novel rectangular embedded dual band EBG structure suitable for frequencies 2.45/5.8 GHz for wearable applications. The primary aim has been to design a compact dual-band EBG to reduce SAR. The EBG structure comprises of U-shaped rectangular slot and a stretched strip with a rectangular patch at end. EBG structure has been designed based on similar methodology as for single band case. A four layer body model has been used for antenna SAR performance evaluation. Similar to case of Single band EBG, computed SAR values for tissue in 1 g and 10 g are found within standard regulatory limits. After detailed

evaluation of design by simulations, proposed EBG array is fabricated and integrated with a twin E-shaped monopole antenna. Experimental evaluation of refection coefficient, radiation pattern, and transmission coefficient of fabricated EBG array is reported. Similar to case of single band antenna, performance of antenna in bending condition is assessed and found acceptable.

Research Publications:-

1. V. R. Keshwani and S. S. Rathod, "Assessment of SAR reduction in Wearable Textile Antenna," *2021 International Conference on Communication information and Computing Technology (ICCICT)*, Mumbai, India, 2021, pp. 1-5, doi: 10.1109/ICCICT50803.2021.9510174.

2. Vidya R. Keshwani, Pramod P. Bhavarthe, and Surendra Singh Rathod, "Eight Shape Electromagnetic Band Gap Structure for Bandwidth Improvement of Wearable Antenna", in Progress In Electromagnetics Research C, Vol. 116, pp. 37-49,2021. http://dx.doi.org/10.2528/PIERC21070603

3. Vidya R. Keshwani, Pramod P. Bhavarthe, and Surendra S. Rathod, "Compact Embedded Dual Band EBG Structure with Low SAR for Wearable Antenna Application", in Progress In Electromagnetics Research M, Vol. 113, 199-211, 2022. http://dx.doi.org/10.2528/PIERM22071704

4. V. R. Keshwani and S. S. Rathod, "Dual Band EBG with low SAR for wearable applications," *2022 IEEE Microwaves, Antennas, and Propagation Conference (MAPCON)*, Bangalore, India, 2022, pp. 1484-1489, doi: 10.1109/MAPCON56011.2022.10046951.

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Title of the Thesis: Study of Event Correlation Analysis Techniques for Network Security

Abstract:
Adversaries constantly attack computer communication networks with the sophistication of network attack strategies. The multi-layered security architecture consists of many security technologies (e.g., Firewall, IDS) to protect the servers, hosts, and applications. However, most security devices have the record function of security events and logs but produce thousands of log records daily. The security information is scattered and can not be shared easily. For privacy, reason organizations are reluctant to make detailed network and audit logs available.
We focus on developing a network model with log-producing systems (IDS, Firewall, Syslog) and log collection using a log server (Rsyslog + LogAnalyzer). The model has the potential to serve as a basis for host-centric and network-centric security event correlation analysis.
We have further developed a comprehensive system model for event handling and correlation analysis to generate an alert in case of malicious activity. In a typical enterprise setup, the burden on a centralized server is reduced with distributed SEC and Venn diagram approach to responding to malicious events quickly. We tested our system using real-time log files from various security devices/systems, reducing the number of alert messages and processing time.
We introduce a method of intrusion alert clustering using Self Organizing Maps (SOM) and the K-means algorithm, which reduces the significant workload of the security team. This time saving helps the security team to address issues significantly faster than they could before, elevating their security.
In network security, we apply machine learning techniques (ML) in detecting network attacks and correlating the event-attributed features of the widely used intrusion datasets. The proposed feature selection technique, the Mean-Weighted Feature Importance Selection (MWFIS), greatly helps to reduce the number of features required to classify the attack. This approach is general and can be applied to any similar dataset.
It is yielded an accuracy of 99.83% and decreased prediction time taken due to an optimized feature set. We further developed a fast processing environment harnessing distributed processing. Furthermore, the system can be implemented using commodity hardware by allowing dedicated cores for our process.

Research Publications:-
Conference Proceedings:
Dayanand D. Ambawade, P. Kedar and Jagdish W. Bakal “A Comprehensive Architecture for Correlation Analysis to Improve the Performance of Security Operation Center”, In: Saini, H., Sayal, R., Rawat, S. (eds) Innovations inComputer Science and Engineering. Lecture Notes in Networks and Systems, vol 8. Springer, Singapore. https://doi.org/10.1007/978-981-10-3818-1 23,2017

Journal Publications:

Dayanand D. Ambawade and Jagdish W. Bakal, "Alert Clustering using Self-Organizing Maps and K-Means Algorithm", International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249-8958, Volume-12 Issue-1, October 2022. doi:10.35940/ijeat.a3852.1012122

International Conference Research Colloquium Poster

1. Dayanand D. Ambawade and Jagdish W. Bakal "Study of Event Correlation Analysis Techniques for Network Security-Machine Learning Approach", International Conference on Communication information and Computing Technology (ICCICT),2-3 Feb. 2018 ,Poster Presentation.

2. Dayanand D. Ambawade and Jagdish W. Bakal "Study of Event Correlation Analysis Techniques for Network Security-Fast Processing Framework", International Conference on Communication information and Computing Technology (ICCICT), 25-27 June 2021 ,Poster Presentation

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Title of the Thesis: Video Analytics for Monitoring of Activities of Elderly People to Detect Neurodegenerative Disease Parkinson.

Abstract:
Parkinson disease (PD) is the one of the most severe neurodegenerative disorder caused by the degradation of dopamine in neurons. PD is commonly defined by impairment in body's balance and motor skills. Motor impairment involves tremor, slowness or absence of movements, postural instability and rigidity. However, non-motor symptoms, such as depression, mood alteration, and digestive issues are also its characteristics. Though PD is not fatal, but progressive and cannot be fully cured. Currently the progression of disease is measured using Unified Parkinson's Disease Rating Scale (UPDRS) which is based on the functional capabilities of patients. Parkinson is highly sporadic occurring at irregular intervals and cannot be observed completely at doctor's clinic. Therefore it is extremely important to examine the patients at their home rather frequent visit to doctor's clinic. Stress anomalies are likely involved in the development of Parkinson disease. With the effect of COVID-19, physical visit of the elderly population to the clinic is considered unsafe. Video based assessment at the patients home led to the solution of avoiding the patient to be exposed to the outside world. We propose a non-invasive video analytics-based assessment of progression of Parkinson disease based on Finger Tapping and Tremor using UPDRS Scale. We also propose a Video based technique utilizing deep learning and convolutional neural networks which analyze the gait characteristics of patients to identify Parkinson. We intend to distinguish a healthy subject and progression of disease at different stages. These techniques can assist clinical experts for examination of patients to identify the progression of the disease. Stress can lead to neuronal loss in brain. Stress dysfunction may impact on preclinical non-motor symptoms of PD (such as depression) and, later in the course of the disease, may worsen motor symptoms. The technology would assist doctors with evaluation and determining progression of the disease. We also examine empirical relationship between Stress acquisition and Parkinson disease progression. The technology could assist clinicians to detect symptoms of patients for evaluation of treatments without the patients visiting the clinic.

Research Publications:-

Journal Publication

• Jignesh Sisodia, Dhananjay Kalbande, 'Video Analytics based multi-symptoms system for determining progression of Parkinson Disease', International Journal of Biomedical Engineering and Technology, Inderscience, ISSN 1752-6426. Web of Science E-SCI, Scopus Indexed.

Conference Publication

• Jignesh Sisodia, Dhananjay kalbande, 'Machine Learning: An aid in detection of Neurodegenerative disease Parkinson', Springer, International Conference on Innovative Data Communication Technologies and Application, 2019.

• Atharva Ranade, Rohan Sodha, Sahil sawant, Jignesh Sisodia and Dhananjay Kalbande, Parkinson's Disease Diagnosis Using Deep Convolutional Neural Networks', IEEE, International Conference on Contemporary Computing and Communications (InC4), 2023.

Poster Presentation

• Jignesh Sisodia, Dhananjay kalbande, 'Video Analytics for Monitoring of Activities of Elderly People to Detect Neurodegenerative Disease Parkinson.' at Research Colloquium, ICCICT 2021, June 2021.

Ms. Masooda Modak

Registration No. 26/12-12-2018
Guide: Dr. Prachi Gharpure
Result Declared:
Email : masooda.modaki@spit.ac.in
Contact no: 9833161007
Program: Computer Engg.
ShodhGanga Link:

Title of the Thesis: Detection of Learning Disability using Learning Analytics.

Abstract:

Learning Disabilities (LD) are generally disabilities in which individuals with average or above average intelligence are affected. This affects the ability to learn all through an individual's life. LD can be a lifetime condition. Some children may have single learning disability or some may have many overlapping learning disabilities . Learning disability may include disabilities in various areas related to reading, language and mathematics. The problems associated with the LD have always been a matter of worry and concern for parents and the school authorities. With the right help at right time, right assessment and remediation, children with LD can and do learn successfully and become winners in the society later It is a great challenge to identify and diagnose and assist children with learning disability. Based on these facts, it is suggested that the early diagnosis of learning disability in children is essentially important to identify and suggest remedial solutions to the parents.

There exist formal methods for diagnosing learning disability. The formal process of diagnosing a learning disability may involve taking history and observing the patient by a trained specialist. Such LD identification centers are very few in cities. Parents are either unaware or may not willing to take their children to undergo such an evaluation. Even if teachers ad-vise, parents may hesitate to such evaluation process because of the unawareness of the society about LD as they might think that the child maybe mentally retarded. In many cases, parents are usually not aware of the disability and confuse the remediation for special training and tuitions. The absence` of proper detection and assistance in the earlier stages of development of the child will affect him/her with the child staying in a constant state of distress and also mentally vulnerable. In such situation, the LD children may lose their sense of self-worth and blame themselves for their situation.

There are some research works which use informal methods for detection of LD. The methods used in these research works to diagnose LD in children depend on the provided checklists which contains the symptoms/signs of the respective learning disabilities. Many times the student himself is not aware that a particular symptom mentioned in the checklist is applicable to him. Sometimes the students are reluctant or hesitant to accept that they possess one or more symptoms specified in the checklist. Moreover, the list of symptoms is static and may not include many other symptoms of the various learning disabilities. Considering the above challenges, we need a system that can understand the learning process of the learner and detect the LD. It could further help in improving the learning. The system

should be able to analyze the symptoms of LD, establish interrelationships between them and diagnose the presence of a learning disability. Once the disability is diagnosed the student will be able to learn according to his/her learning requirements/preferences that may lead to positive performance of the LD learner.

The research intends to build a learner model that is responsible for storing the LD student information. Basically, this model may represents the LD learners knowledge, interests, preferences, goals, background, and individual traits during their learning process, allowing for personalized learning and adaptation towards their learning requirements. The learner model will be continuously revised by the adaptive engine to map the dynamic learning requirements of the LD learner. Based on their learner profile details and the topic selected by the learners, the system will provide the learning content to the user. If there are any changes in learners behavior, the learner profile will be updated immediately.
While learning, the performance monitor will record the various browsing actions such as time spent on learning materials, type of learning content, pass over of learning contents, if any, based on the navigation logs, learning content preferences ,etc. If there are any changes in learners behaviour, the system updates the learner profile immediately. The learners may be assessed based on their test performance. These test performances could be used to identify the knowledge level, learner state, and content complexity. Performance tracker detects LD students online behaviour via LMS and the LD student profile database is updated continuously. With the help of this performance tracker, we can identify the mindset of LD student at particular time period
The performance data is input to the analytics engine to analyze and learn about their reading difficulties, learning style, and cognitive deficits in order to facilitate indication and revision of the learner model. Learning analytics present teachers, parents and students with quick feedback about learning processes of the students. This feature of LA allows shaping the model of education. Learning analytics can detect learning difficulties in individual learners. Language problems (dysorthographia and dyslexia), arithmetic problems (dyscalculia) and even motor skills problems (dyspraxia) can distort learning achievements. Rapid detection and remediation can make a notable difference; especially when the intervention through learning analytics takes into account all the factors resulting from the assessment.

Thus, we aim to develop a system in which a learner may be given a user interface through a LMS. The learner will be provided the content on his requested topic. While the learner is learning from this content, his performance is monitored and the performance data for this learner is stored. The performance data is now analyzed by the learning analytics engine, which analyses the learning behavior or the learning pattern of the learner. The LA engine revises the learner model depending upon the result of analyses. When this learner requests The content for some topic next time, the content is presented to the learner according to the revised model (more appropriate representation of the learner). If the revised learner model has characteristics similar to a learning disabled (already stored profile for a learning disabled), the system can diagnose the learning disability.

Research Publications:-

1. “Adaptive learning and Correlative assessment of differential usage patterns for students with-or-without learning disabilities via learning analytics." ACM Transactions on Asian and Low-Resource Language Information Processing, 22, 12, Article 258 (December 2023), 25 pages. https://doi.org/10.1145/3632365
2. “Design of a deep-learning model to improve learning capabilities of LD children via statistical modelling of examination behavioral patterns" in International Journal of Modern Education and Computer Science (IJMECS)", DOI: https://doi.org/10.5815/ijmecs.2023.03.05, Pub. Date: 8 Jun. 2023
3. "Learning traits and capture mode of learning disability with classification in e-learning for detecting learning disability using machine learning”, International Journal of Health Sciences (IJHS) on 2022, Vol. 6, https://doi.org/10.53730/ijhs.v6nS2.7369”.
4. ”Detection of Learning Disability: A Survey”, International Conference on Data Sciences, Machine Learning and Applications,2020,Springer”.
5. "Detection of Dyslexia using Eye Tracking Measures ",International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8, Issue- 6S4, April 2019.
6. A design patent titled “SMART DESK TO IDENTIFY LEARNING DISABILITIES”, Design Number 375903-001

7. "Design of an augmented bioinspired model for prediction of LD students via online behavior analysis" has been submitted at International Journal of Bio Inspired Computation,Inderscience (2nd revision Submitted-Under ReReview)

Mayura Rupesh Nagar

Registration No.: 34/ 29-01-2019

Guide: Dr. Pooja Raundale

Result Declared: pursuing

Email: gujmayu@gmail.com

Contact no: 9421543244

Program: Master of Computer Application

Title of the Thesis: Improving Early Diagnostic Technique of Diabetic Cardiac Autonomic Neuropathy by Discovering Latent Features

Abstract:

Diabetic Cardiac Autonomic Neuropathy (DCAN) presents a significant challenge in early detection due to its severe consequences on cardiovascular health and the limitations of existing diagnostic tools. This research proposes a novel approach to improve the efficiency of DCAN diagnosis by leveraging latent features derived from diverse medical data generated through electronic devices and clinical trials. Motivated by the pressing need for a non-invasive and highly sensitive method, the study aims to contribute a robust and efficient solution for early DCAN detection. The objectives include extracting hidden patterns from DCAN symptoms, modeling new latent features, and developing an effective method with minimal error. Building upon the shortcomings of current diagnostic tools, particularly the Ewing battery, the research explores Deep Learning as a model-based clustering approach. The methodology involves systematic data collection, latent cluster analysis, and the exploration of interrelated data to identify latent features that contribute to the early diagnosis of DCAN. The scope encompasses the use of a Customized deep belief neural network for Latent Clustering Model with multiple interrelated latent variables to explain the co-occurrence of DCAN symptoms. The anticipated outcomes include the development of a sophisticated Predictive Model for early DCAN detection, enabling progress monitoring and risk stratification. Data for the research is sourced from the Diabetes Screening Complications Research Initiative (DiabHealth) and Charles Sturt Diabetes Complications Screening Group (DiScRi). This research endeavors to significantly enhance the early diagnostic technique of DCAN, benefiting patients through increased awareness, aiding doctors in timely diagnosis, reducing errors in medical tests, and addressing ethical concerns in healthcare services.

Research Publications:

Nagar Mayura, Raundale Pooja, Khandoker Ahsan, & Jelinek Herbert (2022). “A Systematic Literature Review: Role of AI Algorithms for Automated Diagnosis of Diabetic Cardiac Autonomic Neuropathy” [DCAN]. In Proceedings of the 16th INDIACom; INDIACom-2022; IEEE Conference ID: 54597, 2022 9th International Conference on “Computing for Sustainable Global Development” (pp. 23-25). Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi (INDIA). IEEE.

Prof. Manisha Ravindra Bansode

Registration No. 25/07-12-2018
Guide: Dr. Surendra S. Rathod
Result Declared: Thesis submitted
Email : manisha_bansode@spit.ac.in
Contact no: 9820962072
Program: Electronics Engineering.
ShodhGanga Link: -

Title of the Thesis: Design of compact Electromagnetic Band Gap structures for high speed signaling

Abstract:
In high frequency operating circuits, compact and wideband designs are chosen mainly due to its size and cost. Various methods of obtaining Simultaneous Switching Noise (SSN) suppression for improvement in Signal Integrity (SI) and Power Integrity (PI) have been reported. The noise could be produced by the Printed Circuit Board (PCB) internally or by external sources. Since that can spread among the different layers of the power delivery networks, switching noise produced by active components mounted on printed circuit boards is particularly relevant as it can compromise the system signal and power integrity. The planar Electromagnetic Band Gap (EBG) structure has been determined to be an appropriate solution after various methods have been examined to reduce such a noise. Main purpose of this research is to provide compact, wideband coplanar and EBG multilayer structures to improve signal and power integrity by suppression of SSN in high speed circuits. In this research, design, simulation and validation of compact One-Dimensional, Two-Dimensional, Three-Dimensional and mulilayer EBG structures are carried out. Improvement in SI and PI is obtained by suppressing bandwidth of SSN for the designed bridges using step resonance method. The applications for this particular work are in a wide range of S, C and X bands from the electromagnetic frequency spectrum. This will be useful for satellite and terrestrial communication and radar communication applications.

Research Publications:-

Journal Publications

1. Manisha R. Bansode and Surendra S. Rathod, "Compact Planar Electromagnetic Bandgap Structure for Signal and Power Integrity Improvement in High-speed Circuits", *Progress In Electromagnetics Research M*, vol. 114, pp. 233-243, Dec 2022.
2. Manisha R. Bansode, Surendra S. Rathod, "A bandwidth enhanced multilayer electromagnetic bandgap structure to reduce the simultaneous switching noise", *AIMS Electronics and Electrical Engineering*, vol.7, No.4, pp. 406-420, Dec 2023.

Conference Publications

3. Manisha R. Bansode, Rahul Dahatonde and Surendra S. Rathod "Simultaneous Switching Noise Reduction in High Speed Circuits", *Proceedings of IEEE*

International Conference on Communication information and Computing Technology (ICCICT), Mumbai, India, 25-27 June 2021.
4. Manisha R. Bansode and Surendra S. Rathod, "Enhanced Signal and Power Integrity using Novel Planar EBG design", *Proceedings of (APEMC/INCEMIC) Joint Asia-Pacific International Symposium on Electromagnetic Compatibility and International Conference on ElectroMagnetic Interference Compatibility*, Bengaluru, India, 22-25 May 2023.

Mr. Pramod Jagannath Bide

Registration No. 24/11-12-018
Guide: Dr. Sudhir Dhage
Result Declared:
Email : pramod_bide@spit.ac.in
Contact no: 8898248582
Program: Computer Engg.
ShodhGanga Link:

Title of the Thesis: Social Network User Behavior Analytics for Man-made Disasters

Abstract:

When socially sensitive events, such as terrorist attacks, chemical attacks, and rapes, are shared on social media, they garner attention worldwide. Micro blogging platforms such as Twitter are flooded with posts on these events and the developing sub-events around them. Such occurrences are called cross-events. Detecting cross-events is crucial for understanding their nature. Analyzing user behavior during cross- events can provide valuable insights into user behavior. Understanding how a user interacts with these events and gauging their sentiments in ross-events can help comprehend user behavior. With this user data, user emotions between cross-events are analyzed, and user reactions to potential future events are predicted. Using the Wikipedia title database to segment tweets is the basis of event detection. Segment clustering is performed by calculating similarity scores through encoding tweets as vectors using the BERT Model. Identifying user behavior in cross-events on a social networking site is challenging because tracking user's temporal participation in cross-events is difficult, and monitoring their patterns is also a challenge. Detecting tweet clusters belonging to respective cross-events posed a significant challenge since users often participated in numerous events aside from crossevents. During a given time span, a substantial number of tweets flooded cross-events, making it a critical task to track individual users' tweets and their participation in specific cross-events. Not every user participated in all cross-events, and when they did, the number of tweets was limited. Multiple tweets are required to track temporal behavior. Furthermore, many tweets were in regional languages, making segregating the English tweets a challenging task. The Cross-Event Evolution Detection (CEED) framework finds cross-events that originate from big events and share identical temporal characteristics. Various methods have been proposed to analyze user behavior on different parameters. Some of these methods leverage user posting behavior, while others consider user interactions with online content and other

user-related factors. The User Behavior Analysis in Cross- Events (UBACE) framework distinguishes itself from existing frameworks and methods as it primarily focuses on users' tweets and their interaction with ongoing events. This approach aids in better understanding and analyzing user behavior by assessing user sentiment during these events. Experimental results using a Twitter dataset demonstrate the usefulness of the UBACE framework in developing topic evolution algorithms and cross-event detection. The BERT model is employed to analyze user sentiment, achieving an accuracy rate of 94.7% on the dataset it was trained on. The framework also examines the correlation between user engagement in various events and how these relationships evolve over time, offering valuable insights into changes in user behavior and their underlying causes. The model uses low-rank matrix factorization for user-topic prediction and integrates both topical and social context to account for homophily. In the end, when taking into account cross-events, the model has a 95% accuracy rate in predicting emotions.

Research Publications:-

International Journals

1. Pramod Bide, and Sudhir Dhage, "Cross event detection and topic evolution analysis in cross events for man-made disasters in social media streams", International Journal of Computer Applications in Technology (IJCAT) Vol.68,No.2,2022 pp.175–188.
2. Pramod Bide, and Sudhir Dhage, "Comprehensive survey of user behaviour analysis on social networking sites",International Journal of Computer Applications in Technology (IJCAT),Vol.66,No.1,2021,pp 1-18.
3. Pramod Bide, and Sudhir Dhage, "Cross Event User Reaction Prediction on a Social Network Platform",International Journal of Advanced Computer Science and Applications (IJACSA),Vol. 13, Iss. 10, (2022). DOI:10.14569/IJACSA.2022.01310116.
4. Pramod Bide, and Sudhir Dhage,"User Behaviour Analysis during Man Made Disasters on Social Media Platform", Social Network Analysis and Mining,Submitted to Springer Journal (under Review).

International Conferences

1. Pramod Bide and Sudhir Dhage, "Comprehensive Survey of Event Detection Techniques in Social Media Streams," 2020 4th International Conference on Trends in Electronics and Informatics (ICOEI)(48184), 2020, pp. 324-331

2. Pramod Bide and Sudhir Dhage, "Similar Event Detection and Event Topic Mining in Social Network Platform," 2021 6th International Conference for Convergence in Technology (I2CT), 2021, pp. 1-11.

Annexures

Different application forms employed in Research programs

Sr. No.	Application form
1	Research Topic Approval
2	Research Title Approval
3	Progress Seminar
4	Pre-Synopsis Approval by external
5	Pre-Synopsis Approval stage 1
6	Thesis Submission Approval
7	Thesis submission form
8	University of Mumbai Application for Extension for Research Student
9	University of Mumbai Research Advisory Committee Presentation of research proposal and RAC Comments
10	Attendance Sheet of Ph.D. (Technology) Synopsis/Thesis Viva-Voce Examination
11	Ph.D. (Technology) Open Defence Viva Voce Committee
12	Notice of Ph.D. (Technology) Open Defence Viva-Voce Examination
13	Ph.D. (Technology) Open Defence Viva Voce of Research Scholar's Attendance
14	Notice of Ph.D. Online Open Defence Viva Voce with Venue details
15	Letter of Appointment for Question paper Setting
16	Ph.D. Course work Completion Certificate with Grades
17	Ph.D. Course work Completion Certificate
18	Research work Progress not satisfactory
19	Research Scholar's attendance certificate
20	Invitation as co-guide from SP-IT center
21	Letter to University to Appointment and approval of Co-Guide
22	NOC from a Competent Authority of the Institution of the External Guide to Supervise candidate's work of PhD.
23	Consent Letter to be a Ph.D. Guide from external supervisor
24	Securing a No Objection Certificate (NOC) from SP-IT to obtain approval from the Research Supervisor for pursuing an application to an alternative research center.
25	Request letter from Research scholar to SP-IT to appoint Supervisor from other centers
26	Obtaining a No Objection Certificate (NOC) from SP-IT to seek approval from the Research Supervisor for applying to another research center
27	Appointment as a Ph.D. Supervisor to Research Scholar
28	Member of Research Advisory Committee (RAC)
29	Research Recognition Committee (RRC) Meeting Minutes
30	Research Experience Certificate
31	Discontinuation of Ph.D. registration.

BharatiyaVidyaBhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

Sardar Patel Institute of Technology

Ph.D. (Faculty of Technology)

Date:

RESEARCH SCHOLARS RESEARCH TOPIC PROPOSAL

Name of the Research Scholar : .....

Registration No. : .....

Department :

Date of Admission :

Title of Research Proposed : .....

Expert Comments:

a) Breadth of literature survey: done / more required / to be started .....

b) Gap analysis: issues identified .....

.....

c) Focus of presentation: appropriate / need improvement .....

d) Quality of presentation: .....

e) Final Remarks: (i) Topic approved .....

(ii) Recommended for further revision & presentation.....

(iii) Topic not approved .....

Name and signature of the expert Date:

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Research Title Proposal

Date:

Name of the Research Scholar : .....

Department : Ph.D. (----------)

Date of Admission :

Name of the Supervisor(Optional) ..... :

Topic/Tile of Research :

Following are the suggestions of Research Review Committee:

a. Is the Problem Scope sufficient for Ph.D. :

b. Is the candidate line of thinking leads towards solution :

c. Is the proposed Title/field of research too narrow / broad :

RRC Member Name Signature

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

PROGRESS REPORT OF RESEARCH SCHOLARS

Date: APS number:

Name of the Research Scholar : .....

Department : .....

Date of Admission : .....

Registration/UID No. : .....

Name of the Supervisor : .....

Title of Research : .....

Period of report : from…… to .....

A brief write-up on the progress made so far :

Expert Comments:

Expert Name & Signature

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Pre Synopsis Approval by External

Date: APS number:

Name of the Research Scholar : .....

Department : .....

Date of Admission : .....

Registration/UID No. : .....

Name of the Supervisor : .....

Title of Research : .....

Period of report : from…… to .....

The number of APS reports submitted (attach proof) to university:

(make a summary of APS expert comments and how they are addressed)

A brief write-up on the progress made so far:

Objectives of Research:

Contributions made in research:

List of papers Published:

A. List of Peer-reviewed Journal publications (at least one compulsory)

(make a summary of reviewers comments and how they are addressed)

B. List of conference proceedings

(to be filled by Expert/Supervisor/Chairman)

Is the candidate has done sufficient work for giving pre synopsis please justify:

If YES, before how many days the candidate is allowed to submit the thesis:

If NO, suggested to:

Any other comments by Expert/Supervisor/Chairman:

{The examiners may (i) recommend for submission; (ii) corrections to be made and resubmission; (iii) corrections to be made in consultation with the supervisor; (iv) reject the work.}

Name & Signature Date

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Pre Synopsis Approval Stage-1

Date:

Name of the Research Scholar : .....

Department : .....

Date of Admission : .....

Registration/UID No. : .....

Name of the Supervisor : .....

Title of Research : .....

Period of report : from..... to .....

Is the candidate has done sufficient work for giving pre synopsis please justify:

Please comment about quality of publications:

Any other comments by Expert

{The examiners may (i) recommend for submission; (ii) corrections to be made and resubmission; (iii) corrections to be made in consultation with the supervisor; (iv) reject the work.}

Name & Signature Date

BharatiyaVidyaBhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Thesis Submission Approval

Date: Date of Pre-Synopsis:

Name of the Research Scholar : .....

Department : .....

Date of Admission : .....

Registration/UID No. : .....

Name of the Supervisor : .....

Title of Research : .....

Period of report : from..... to .....

Number of APS reports submitted (attach proof) to university:

Plagiarism analysis (attach proof):

Comments of Expert/Supervisor/Chairman during pre-synopsis:

Any improvements after pre-synopsis:

(to be filled by Expert/Supervisor/Chairman)

Is the candidate has done sufficient work to submit the thesis please justify:

If NO, suggested to:

Any other comments by Expert/Supervisor/Chairman:

{The examiners may (i) recommend for submission; (ii) corrections to be made and resubmission; (iii) corrections to be made in consultation with the supervisor; (iv) reject the work.}

Name & Signature Date

BharatiyaVidyaBhavan's

Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Thesis Submission

Photo

Date:

Name of the Research Scholar : .....

Correspondence Address : .....

Email : .....

Mob : .....

Department : .....

Date of Admission : .....

Registration/UID No. : .....

Name of the Supervisor : .....

Title of Research : .....

Period of Research : from..... to .....

Date of defense : .....

Name of the Chairman : .....

Name of the examiner : .....

Attach:

a. Abstract
b. Synopsis
c. Thesis
d. List of papers Published:
    i. Peer reviewed Journal publications
    ii. Conference proceedings
e. Softcopy of the above
f. No dues Certificate

Name & Signature Date

BharatiyaVidyaBhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

Application for Extension for Research Student

Name _____
Address _____
_____

Mobile no. _____
Email Id _____
Date _____

The Director,
Board of Examination & Evaluation,
Thesis Section,
University of Mumbai,
Fort, Mumbai – 400 032.

Sir,

I wish to apply for extension for pursuing _PhD in _____ course.

1. Name of the Student :- _____
2. Registration No. / Date :- _____
3. Research Title :- _____
4. Name of the Research Institute :- _____
5. Name of the Guide :- _____
6. Date of Superannuation of Guide :- _____
7. Position of Research work (% of work completed till date) :- _____
8. Period required for submission of Thesis _____2 years_____
9. Whether earlier extension availed or otherwise if 'Yes' , Please submit Xerox Copy of the same :- _____No_____

10 Period of extension required :- From _____ to _____

11 Reason :- _____

Yours Faithfully,

( )

BharatiyaVidyaBhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

I hereby recommend that the extension may be given for a period of _____

_____ to _____ under my guidance.

_____

Research Guide

Name _____

Mobile No _____

Forwarded to the Director, Board of Examination & Evaluation, Thesis Section, University of Mumbai, Fort, Mumbai – 400 032, for further necessary action.

Seal of College

_____

Head / Director / Principal
Research Centre

University of Mumbai

Research Advisory Committee

Presentation of research proposal and RAC Comments

Candidate	Ph.D. Research Proposal	Guide	RAC External Expert	Day/Date/Time

Expert Comments:

External Expert Member :

Guide : **Ph.D Candidate**

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Attendance Sheet of Ph.D. (Technology)

Synopsis/Thesis Viva-Voce Examination

Student:

Department:

Title of thesis:

Venue: Sardar Patel Institute of Technology

Date & Time:

Supervisor:

Examiner:

S.N.	Name	Designation	Signature
1			
2			
3			
4			
5			
6			
7			

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Ph.D. (Technology) Open Defence Viva Voce Committee

Student:

Department:

Title of thesis:

Venue: Sardar Patel Institute of Technology

Date & Time:

Supervisor:

S.N.	Designation	Name	Signature
1	Chairperson (Head of the Research Centre or nominee)		
2	Convenor (Research Guide)		
3	External Examiner		
4	Other Department Professor		
5	Professor/Associate Professor		
6			

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Notice of Ph.D. (Technology) Open DefenceViva-Voce Examination

This is to inform that open defense viva examination of Mr./Ms.---------- for Ph.D. (Technology) degree in the subject of ----------Engg. will be held on Date: Month: Year at Time: in Sardar Patel Institute of Technology, Bhavan's Campus, Munshi Nagar, Andheri (W), Mumbai 400 058 in Room No. ---------.

The title of her thesis is ----------.

All Research scholars and faculty members are invited to attend the same.

Dean Academics & Research

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Ph.D. (Technology) Open Defence Viva Voce of Research Scholar's Attendance

Student:

Department:

Title of thesis:

Venue: Sardar Patel Institute of Technology

Date & Time:

Supervisor:

S.N.	Designation	Name	Signature
1			

NOTICE

Date:

To: All Ph.D. Guides, Faculty, and Ph.D. Students

Sub.: Ph.D. Online Open Defence Viva Voce of Mr./Ms. ---------- for the degree of the "Doctor of Philosophy (Technology)" in ---------- Engineering.

Ref.: Email received from RAPC of University of Mumbai dated ----------

I am pleased to inform you all that the Online Open Defence Viva of Ph.D. candidate under the Bharatiya Vidya Bhavan'sSardar Patel Institute of Technology, Ph.D. Research Centre of UoM is scheduled on Date, Month, year at ---- am/pm.

All concerned are invited to attend the "Ph.D. Online Open Defence Viva" of the following candidate who has submitted the Thesis to University of Mumbai for the Award of Degree of Doctor of Philosophy (Technology).

Name of the Candidate:
University Registration Number:
Faculty: Technology
Subject: Engineering
Title of the Thesis:

The Online Open Defence Viva will be held on ---------- Google Meet platform and the link for the same is as follows:

Google Meet joining info:

To join the video meeting, click this link:

The candidate should join 15 mins prior to the scheduled time and keep the video ON during the Defence and Viva presentation. The attendees will be permitted to ask the questions with the permission of Chairperson & University Representative of UoM of the Defence.

Kindly make a note of the same and make it convenient to attend.

Dean Academics & Research

Copy to:
RAPC, Chairperson, University Representative, and External Examiner
Convenor& Ph.D. Guide/Supervisor
Head of Research Centre

Notice Board

Letter of Appointment for Question Paper Setting

Dear Sir/madam,

I am pleased to inform you that you have been appointed as a question paper setter and examiner for the screening test of Ph.D. candidates. The test is scheduled ----------. We request you to set the multiple choice question paper of one hour duration. The Maximum marks to be awarded are ----------. The syllabus is as per the GATE of respective discipline. You are requested to maintain the confidentiality regarding this appointment.

Sr. No.	Program	Examiner-1	Examiner-2	Signature
1				
2				
3				
4				

Dean Academics & Research

Ph.D. Course work Completion Certificate

(Faculty of Technology, University of Mumbai)

Mr./Ms.---------- was admitted as a Ph.D. (---------- Engineering) candidate at Sardar Patel Institute of Technology Research Center from ----------. This is to certify that he has successfully completed all the required courses for the Ph.D. programme during the academic year ----------. The details of the course work done are given below.

S. No	Course Code	Course Name	Credits	Grade
1	101	Research & Methodology	6	
2	102	NPTEL: NPTEL:	6	
3	CPE-RPE	Research and Publication Ethics	2	
4	103	Seminar	4	

Credits	Earned Grade Points	SPI	Final Grade
18			

Dean Academics & Research Principal

Ph.D. Course work Completion Certificate

(Faculty of Technology, University of Mumbai)

This is to certify that **Mr/Ms. ----------** has been a regular student of Ph.D. He/She attended the coursework conducted at the recognized research center from ---------- to ---------- during the year ----------. He/She has successfully completed the Ph.D. coursework prescribed by the University of Mumbai. He/She secured **"-----"** grade on the ten-point scale.

Guide Dean R&D Principal

To, Date:

Research Scholar, ---------- Engineering,

Subject: your research work Progress not satisfactory

This is to inform you that after conducting successive reviews, it is observed that progress in your research work is **not satisfactory**. You are immediately required to discuss with your guide the comments given by experts and start working on it. A special progress seminar will be taken in the **month of ----------** for you to review your progress and take further decision.

Dean Academics & Research Ph.D. Guide Principal

Date :

To,
The Dean,
----------,
Mumbai.

Subject : ATTENDANCE CERTIFICATE

Dear Sir/Madam,

This is to certify that Mr./Ms. ---------- Ph.D. Research Scholar of SP-IT in the Department of ---------- Engineering has carried out his/her research work in Research Lab ---------- on ---------- from ----------to----------.

This is for your kind information

Supervisor

To

Dr.

Dear -------

Subject: Invitation as co-guide to ----------, Research scholar

We have received a request from ----------, Ph.D. Scholar (------- batch), ---------- Engineering department of SP-IT for accepting you as her co-guide/co-supervisor for his/her research work on ----------.

It will be highly appreciated if you kindly accede to his/her request and intimate us so that the matter could be further processed.

Thanks.

Dean Academics & Research

To,

The Registrar,

Thesis Section, University of Mumbai, Kalina, Mumbai.

Subject : Appointment and approval of Co-Guide for the Ph.D. in ---------- Engineering at our institute.

Respected sir/madam,

We have a research scholar named Ms./Mr.---------- who is working in the area of "----------". The title of her proposed research is "----------". He/She is working under the guidance of Dr. ----------, Professor ----------Engg. Department at our institute.

We wish to appoint Dr. ---------- who is a Professor in ---------- Engineering Department at ----------, Mumbai as a co-guide for Ms./Mr. forhis/her above mentioned research work.

Thus we request you to do the needful to approve Dr. ---------- as a Co-Guide for the above mentioned research work.

Thank you.

Yours Truly

Principal Dean Academics & Research

Enclosures :

1. No objection letter of the Guide
2. Proposed Co- Guide's willingness letter
3. Resume of the proposed Co- Guide

Ref No. Date :

To

The Principal

Sub: No Objection Certificate from a Competent Authority of the Institution of the

External Guide to Supervise candidate's work of PhD.

Dear Sir/madam,

Our Institute / College has no objection for Dr. ----------or accepting Ms./Mr. Ph.D. (Tech.) student and for guiding his/her research work leading to PhD (Tech.) degree in -------Engg.at Research Centre of Mumbai University at ----------. He/She shall extend all the possible guidance to enable the student to carry out her research programme towards the submission of thesis.

Thanking you and with kind regards,

_____

Dean Academics & Research

No. Date:

To,

The Principal,Sardar Patel Institute of Technology,Bhavans campus, Munshi Nagar,Andheri (W), Mumbai - 400058

Sub: Consent Letter to be a Ph.D. Guide for Ms./Mr.

Dear Sir/Madam,

With reference to the above-mentioned subject, I wish to inform you that I am willing to accept Mr./Ms. ----------- as my Ph.D. student and for guiding her/his research work leading to Ph.D. (Tech.) degree in ---------- Engineering at Sardar Patel Institute of Technology (Research Center). I am recognized guide of Mumbai University (with Reference No. of recognition letter ----- dated ----------). I shall extend all possible guidance to enable the student to carry out her research programme towards the submission of thesis.

Thanking you and with kind regards,

Yours sincerely,

Name & Sign.

Ph.D. recognized teacher (Guide)

No. Date :

To,

The Dean Academics & Research,Sardar Patel Institute of Technology,Bhavans campus, Munshi Nagar,Andheri (W), Mumbai-400058

Sub.: No Objection Certificate from a Competent Authority of the Institution of the External

Guide to Supervise candidate's work of Ph.D.

Dear Sir,

Our Institute ----------, has no objection Dr. ---------- for accepting Mr./Ms.---------- as Ph.D. (Tech.) student and for guiding her/his research work leading to Ph.D. (Tech.) degree in ---------- Engineering, at Research Centre of Mumbai University at Sardar Patel Institute of Technology.

He/She shall extend all the possible guidance to enable the student to carry out her research programme towards the submission of thesis.

Thanking you and with kind regards,

_____

Principal

No. Date

To,

The Dean Academics &Research,Sardar Patel Institute of Technology,Bhavans campus, Munshi Nagar,Andheri (W), Mumbai-400058

Sub: Guide for Ph.D. in ---------- Engineering

Dear Sir,

With reference to the above-mentioned subject, I wish to inform you that I, Ms./Mr.

being research scholar in ---------- Engineering department at Sardar Patel Institute of Technology, my proposed research work is in the field of ---------- so I would like to have Dr. ---------- working in ----------College as my research guide.

I will be highly obliged if you accept our request. Hoping to have your association with my research center institute for the above-mentioned research work.

Thanking you and with kind regards,

Yours sincerely,

Student's Name & Sign.

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Dr. --------- is working in this college as a ---------- in ---------- Engineering Department. He/She is a Ph.D. Guide in ---------- Engineering at our Research Center. The college has no Objection if he associates as a Ph.D. Research Guide in ---------- Engineering in Ph.D. Research Centre of ---------- Engineering College, ----------.

Thanking you

PRINCIPAL

To,

Sardar Patel Institute of Technology,Andheri(West),Mumbai-400058.

Sub: Appointment as a Ph.D. Supervisor in ---------- Engineering

Dear Sir,

You are appointed as a Ph.D. supervisor in the Ph.D. Technology Program of Mumbai University for ---------- Engineering in Sardar Patel Institute of Technology. As per the recommendation of the RRC committee, I would like to inform you that_____ is allocated to do research work under your supervision.

You also need to discuss the course work (18 credits) , to be done by candidate, which need to be completed before registration in Mumbai University.

Please note that, at the end of the semester i.e. during ----------, there will be Progress Seminar.

Dean Academics & Research

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Allotment of Ph.D. Candidates

Academic Year (20 – 20)

As per the recommendations of the RRC committee of ---------- Engineering held on 20 , the following faculties are agreed to act as a Ph.D. Supervisor for following eligible candidates:

Sr. No.	Name of the Candidate	Name of the Supervisor	Program
1			
2			
3			

Principal Dean R&D Head of the Department

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Supervisor allocation

Date:

To,
The Principal,
S.P.I.T. Research Center
Sub: Supervisor allocation for my research work.

Respected Sir,

I _____ of branch_____
request you to allocate me supervisor for my research work. I abide by the rules of the research center. I have taken the concern of the proposed supervisors who are related to the proposed area of my research. Hence, I request you to appoint any one of the following:

1. Dr_____ as supervisor/co-supervisor {other than S.P.I.T.}
2. Dr_____ as supervisor/co-supervisor {other than S.P.I.T.}
3. Dr_____ as supervisor/co-supervisor {other than S.P.I.T.}
4. Dr_____ as supervisor/co-supervisor {other than S.P.I.T.}

My Research Area:

Research Objectives:

Sincerely

Name:

Sign: Date:

BharatiyaVidyaBhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400058, India
(Autonomous Institute Affiliated to University of Mumbai)

Bharatiya Vidya Bhavan's
Tel : 91-22- 2670 8520
2670 7440
2628 7250
Fax : 91-22- 2670 1422

(Founded in 1938 by Kulapati Dr. K. M. Munshi with the blessings of Mahatma Gandhi)
आ नो भद्रा : क्रतवो यन्तु विश्वत : ।
Let noble thoughts come to us from every side

SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Autonomous Institute)
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai - 400 058, India
E mail: principal@spit.ac.in Website: www.spit.ac.in

To, Date:

Sub: Member of Research Advisory Committee (RAC)

Dear Sir,

On behalf of the Sardar Patel Institute of Technology Research Center, we extend our heartfelt invitation for your esteemed participation as a valued member of the Research Advisory Committee (RAC). Your extensive expertise in Engineering/Technology has led us to seek your guidance and insight per UGC/UoM norms. Your engagement with the RAC will span from the initial Title Approval stage to the successful submission of the student's Thesis.

In accordance with UGC regulations, the RAC assumes the responsibility of overseeing students' progress through the Six-Monthly Research Progress Seminar (RPS) and offering valuable direction to ensure the timely completion of their Ph.D. endeavors. We will soon facilitate communication between the research scholars/guides and yourself, sharing tentative Research Titles and progress updates for the respective students within your area of expertise.

Furthermore, we wish to bring to your attention that the RPS presentations will be conducted in an online format.

The primary objective of the RPS is to review the ongoing research progress, authorize Titles, and provide guidance regarding the completion of any remaining "Course Work."

We extend our sincere gratitude for graciously accepting our invitation and for your willingness to contribute, even amidst your busy commitments.

With Warm Regards,
Dean Academics and Research

Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Ph.D. (Faculty of Technology)

Research Recognition Committee Meeting Minutes

Minutes of the -------Research Recognition Committee for appointment of supervisor/topic approval held on -------- at ----------. in the meeting room of Principal's office. Following subject experts are present:

Committee:

1.

2.

3.

Agenda:

a. To approve research topic/area proposed by the scholar.
b. Comments/approval of preliminary work.
c. Discussion on the work plan
d. Suggestion/Appointment of research supervisor/guide.
e. Suggestions for the course work.

Ref No: Date:

Research Experience Certificate

This is to certify that Dr. ----------, was a full time research Scholar in ---------- ------ Department from ---------- to ----------. The tile of his research was " ---------- -----", under the supervision of Dr.----------. He has defended his research work on ----------

Dean Academics & Research

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To,

SUB: Absentee in Ph.D. Progress Seminars

Dear Scholar,

We organize a regular Ph.D. Progress Seminar for all scholars in the center. The purpose of this progress review is to ensure that Ph.D. students and their research supervisors are communicating regularly regarding the student's progress on thesis research and the scholars overall research progress / development.

Scholars also need to present the work regularly as per stipulated time, and record of it will be noted in your progress report. If scholars do not present the APR/ RPS two times in Ph.D. study, then they will be discontinued from the registration, they need to give in writing to the Principal and have an authorized approval on the same, failing to do so necessary actions will be taken.

Request you all to give a presentation in APS to avoid the discontinuation of Ph.D. registration.

Regards,

Dean Academics & Research