Smita Pradhan, Ph.D.

House no-844, Srikanthapur, Gopalgaon, Baleswar

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Education

2011-2017   Ph.D. (Electrical Engineering)

Specialization: Electronics Communication System

National Institute of Technology, Rourkela, Odisha, India (CGPA-8.98)

Thesis: Development of Efficient Intensity based Registration Techniques for Multi-modal Brain Images.

Advisor: Dr. Dipti Patra

2007-2010   M.Tech. (Res.) (Electrical Engineering)

Specialization: Electronics Communication System

National Institute of Technology, Rourkela, Odisha, India (CGPA-8.8)

Thesis: Development of Unsupervised Image Segmentation Schemes for Brain MRI using HMRF model.

Advisor: Dr. Dipti Patra

2002-2006   B.Tech. (Applied Electronics & Instrumentation Engineering)

PIET, Biju Patnaik University of Technology, Rourkela, Odisha (68.2%)

Teaching and Research Experience

- Visiting Faculty in School of Biomedical Engineering, Indian Institute of Technology, Banaras Hindu University, Varanasi, (July 2017 - June 2019)
- Research Fellow in ISRO Project, Dept. of Electrical Engineering, National Institute of Technology, Rourkela, (Feb 2017 – July 2017)
- Research Scholar in the Department of Electrical Engineering, National Institute of Technology, Rourkela, (July 2011 – Aug 2016)
- Assistant Professor in the Department of Applied Electronics and Instrumentation Engineering, PIET, Rourkela (Jan 2007 – July 2011)
- Ad Hoc Faculty in the Department of Electronics and Tele-communication Engineering, UGIE, Rourkela (Oct 2006 – Jan 2007)

Awards & Recognition

Ministry of Human Resource Development Scholarship during Ph.D. program in National Institute of Technology, Rourkela.

Research Interest

- Inverse Problem in Image Processing.
- Computer Vision.
- Image Analysis & Image Segmentation.
- Artificial Intelligence.
- Machine Learning

Technical (Soft) Skills

1. Latex for document & presentation slide preparation.
2. Proficiency in MS Office
3. MATLAB programming for signal & image analysis & processing, computer vision.
4. C programming in LINUX for image processing application.
5. LabVIEW Programming for basic signal and Image processing design.

Publications

Publications in Refereed Journals

1. A Maharana, D Patra, and **Smita Pradhan***, "Robust spatial information based tumour detection for brain MR images", IET Electronics Letters, vol. 56 (25), pp. 1398-1400, 2020. doi:10.1049/el.2020.2703 SCI IF- 1.316
2. **Smita Pradhan**, Dipti Patra, "Enhanced Mutual Information based medical image registration", IET Image Processing, vol. 10 (5), pp. 418-427, 2016. https://doi.org/10.1049/iet-ipr.2015.0346 SCI IF- 1.995
3. **Smita Pradhan**, Dipti Patra, "RMI Based Non-rigid Image Registration Using BF-QPSO Optimization and P-spline", AEU-International Journal of Electronics and Communications, vol. 69 (3), pp. 609-621, 2015. https://doi.org/10.1016/j.aeue.2014.11.003 SCI IF- 3.183
4. Dipti Patra, Manab Kumar Das, **Smita Pradhan**, "Integration of FCM, PCA and Neural Networks for Classification of ECG Arrhythmias", IAENG International Journal of Computer Science, vol-36 (3), pp.24-62, February 2010. SCI IF-1.68

Publications in Scopus indexed

1. Anmol Maharana; **Smita Pradhan**; Dipti Patra. "Elliptical region of interest based saliency detection". 2017 14th IEEE India Council International Conference (INDICON). Oct 2018, doi:10.1109/INDICON.2017.8487753 IIT, Roorkee, 15-17, Dec
2. **Smita Pradhan**; Dipti Patra. "P-spline based nonrigid brain MR image registration using regional mutual information". 2013 Annual IEEE India Conference (INDICON). Dec 2013, doi:10.1109/INDCON.2013.6726145 IIT Mumbai, India 13-15 December

3. **Smita Pradhan**; Dipti Patra. "Unsupervised Brain Magnetic Resonance Image Segmentation Using HMRF-FCM Framework". 2009 Annual IEEE India Conference. Dec 2009, doi:10.1109/INDCON.2009.5409417 DAIICT, Gandhinagar Ahmedabad, 18-20 Dec.

Book Chapters

1. **Pradhan S**, Dipti Patra, (2014) Nonrigid Image Registration of Brain MR images using Normalized Mutual Information, Advances in Intelligent Systems and Computing, vol 236. Springer, New Delhi. https://doi.org/10.1007/978-81-322-1602-5_112.
2. **Pradhan S**., Patra D., Singh A. (2017) Image Registration of Medical Images Using Ripplet Transform. Advances in Intelligent Systems and Computing, vol 460. Springer, Singapore. https://doi.org/10.1007/978-981-10-2107-7_44
3. **Pradhan S**., Singh A., Patra D. (2018) Enhanced Mutual Information-based Multimodal Brain MR Image Registration Using Phase Congruency. Advances in Intelligent Systems and Computing, vol 518. Springer, Singapore. https://doi.org/10.1007/978-981-10-3373-5_19

Publications in Conferences

1. **Smita Pradhan**; Dipti Patra. "Non-rigid medical image registration using adaptive knot selection in P-spline". 2016 IEEE Students' Technology Symposium (TechSym). Oct 2016, doi:10.1109/TechSym.2016.7872691 IIT, KGP, 30 Sep- 2 Oct
2. Dipti Patra; **Smita Pradhan**. "Development of fuzzy clustering based unsupervised scheme for medical image segmentation using HMRF model". 2010 International Conference on Industrial Electronics, Control and Robotics. Dec 2010, doi:10.1109/IECR.2010.5720148 NIT, RKL, 27-29- Dec
3. **Smita Pradhan** and Dipti Patra, "Unsupervised Brain MR Image Segmentation using Biased Hidden Markov Random Field Model," Indian International Conference on Artificial Intelligence (IICAI), pp. 1519-1530, Dec 2009, SIT, Banglore, India. 14-16 Dec
4. **Smita Pradhan** and Dipti Patra, "Integration of ICA, PCA and Neural Networks for Classification of ECG Arrhythmias" International Conference on Soft Computing (ICSC), pp., Nov 2008, IET, Alwar, India. Nov 8-10.
5. **Smita Pradhan** and Dipti Patra, "Brain MR Image Segmentation using Biased Hidden Markov Random Field Model," In Proceeding of International Conference on Advancement in Wireless Technologies and its Applications, pp. 130-134, Dec 2008, NIT, Surat, India.
6. T. Haribabu, **Smita Pradhan** and Dipti Patra, "Tissue Classification of Brain MR Images using Adaptive Fuzzy C-Means Algorithm," In Proceeding of National Conference on Computational intelligence, control and computer vision in robotics and automation, pp.162-166, Mar 2008, NIT, Rourkela, India.
7. Dipti Patra, and **Smita Pradhan**, "Intensity Inhomogeneity correction of Brain MRI using EM Algorithm," In Proceeding of National Conference on

Computational intelligence, control and computer vision in robotics and automation, pp. 194-198, Mar 2008, NIT, Rourkela, India.

(ATAL) Academy sponsored Faculty Development Programme (FDP) Attended

1. Signal Processing and Machine Learning towards Engineering Applications, 23th to 27th August 2021
2. IoT & Cyber Security, 6th to 10th Sept 2021
3. An Insight into Biometrics for Digital Forensics, 25th to 29th Sept 2021
4. Introduction to Speech Processing and its Applications using AI-ML (ISPA), 25th to 29th Sept 2021

Training Attended

1. VLSI Design and related Software, NIT, Rourkela, 9th May – 4th June 2005
2. CMOS Digital IC Design, NIT, Rourkela, 7th - 18th May 2007
3. National Workshop on Soft Computing, IET, Alwar, Rajasthan, 08th - 10th Nov 2008
4. National Workshop on Bioinformatics, Centre for Soft Computing Research, ISI Kolkata, 15th – 17th Feb 2012
5. Advanced Engineering Optimization through Intelligent Techniques, SVNIT Surat, Gujarat, 14th -18th May 2012
6. National Workshop on Image and Video Analysis Centre of Soft Computing at ITER, BBSR, Orissa, 16th – 18th May 2013
7. Aesthetics of Scientific Documentation, NIT, Rourkela, 16th -17th July, 2014
8. Intellectual Property and Innovation Management in Knowledge Era, NIT, Rourkela, 24th – 24th Nov 2015
9. Advanced Image Processing Solutions for emerging Challenges in Medical Applications, NIT, Rourkela, 25th – 26th September, 2016
10. Artificial Intelligence, Signal & Image Processing using NI LabVIEW, NIT, Rourkela, 15th – 24th June, 2017
11. Summer school on computer vision: recent advances in computer vision, IIIT, Hyderabad, 3rd – 8th July, 2017
12. Recent trends in Medical Signal and Image Processing, NIT, Rourkela, 25th – 26th March, 2017

Research Project Supervised

1. EEG feature extraction and classification with respect to Brain Computer Interfaces.

Internships:

Three months research internship in the Department of Computer Science and Engineering at University of South Carolina (USC) between Aug. 7th and Oct. 27th 2014.

Technical Invited Talks:

Delivered a talk on "MATLAB and Simulink in Engineering", at Department of Electrical Engineering, UGIE, Rourkela, on 09 May 2015.

Professional Association

- Associate member, IEI, 2010 – (Membership number: A-549126-7)
- Google Scholar: https://scholar.google.com/citations?user=yTj6DzMAAAAJ&hl=en&oi=ao

Reviewer in Refereed Journal and Conferences

- CMIR (Current Medical Imaging Reviews)
- Computer Vision and Image Processing -2016
- TENCON-2016
- TENCON-2017

Theory Taught

- Introduction to Biomedical Engineering (BM-101) U.G.
- Computer Application in Biomedical Engineering (BM-5101) P.G.
- Artificial Intelligence and its Application to Biomedical Engineering (BM-411) U.G.
- Bioinstrumentation and Medical Imaging Modalities (BM-401) U.G.
- Bioinstrumentation (BM-509) P.G.
- Microprocessor and microcontroller (BM-311) U.G.
- Electronics measurement and Instrumentation for Biomedical Application (BM-301) U.G.
- Digital Image and Speech Processing, (CPEC 5402) U.G.
- Digital Electronics Circuit, (CPES 5203) U.G.
- Principles of Measurement Systems, (CPEN 5302) U.G.
- Electronics Inst. and Measurements CPEN 5303) U.G.
- Biomedical Inst. & Measurement (PEBM8401) U.G.
- Computer Vision (TA in Dept. of EE, NIT, RKL) P.G.
- Digital image Processing (TA in Dept. of EE, NIT, RKL) U.G.

Sessional

- Electronics measurement and Instrumentation for Biomedical Application (BM- 301) U.G.

- Microprocessor and microcontroller (BM-311) U.G.
- Introduction to Biomedical Engineering (BM- 101) U.G.
- Computer Application in Biomedical Engineering (BM 5103) P.G.
- Artificial Intelligence and its application in Biomedical Engineering (BM - 511) P.G.

References

1. Dr. Dipti Patra
   Professor, Dept. of Electrical Engineering, NIT Rourkela, Odisha, India-769008
   Phone: 0661-2462410 (O), 0661-2463410 (R), 9437390400 (M)
   E-mail: dpatra@nitrkl.ac.in
2. Dr. Neeraj Sharma
   Professor, School of Biomedical Engineering, IIT (BHU), Varanasi, India-221005
   Phone: 9235633730 (M)
   E-mail: neeraj.bme@ iitbhu.ac.in

Personal Profile

- Father's Name: Sudarshan Pradhan (Retd. bank employee)
- Mother's Name: Mrs. Pramila Pradhan (Homemaker)
- Husband's Name: Dr. Bikash Ranjan Giri (Asst. Professor, KKS Women's College, Baleswar)
- Marital Status: Married.
- Nationality: Indian.
- Date of Birth: 5th July 1984.
- Language Known: English, Odia, Hindi.

I declare that all information furnished above are true to the best of my knowledge.

Smita Pradhan.