NITIN KUMAR

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RESEARCH INTERESTS

Applied Machine Learning in Image Analysis and Signal Processing, Medical Image Computing, Computer Vision, Graph Representation Learning

EDUCATION

Doctor of Philosophy(PhD)
Computer Science & Engineering, **Indian Institute of Technology, Bombay** 2020
(Advised by Prof. Suyash P. Awate and Prof. Ajit V. Rajwade)
Dissertation: Robust Kernel-based Unsupervised and Semisupervised Learning for Abnormality Detection in Medical Images

Master of Engineering
Computer Science & Automation, **Indian Institute of Science, Bengaluru** 2013
(Advised by Prof. C.E. Veni Madhavan)
Thesis: Features based Approach to Lexical Simplification

Bachelor of Technology
Computer Science & Engineering, **National Institute of Technology, Warangal** 2007

EXPERIENCE

Shiv Nadar University, Noida Campus July 2023 - Present
Assistant Professor *Noida, NCR*

Philips Research, Bengaluru Nov 2021 - March 2023
Research Engineer II, Artificial Intelligence & Data Science

Was involved in the non-image and image based synthetic data generation and verification processes. Generated and analyze the synthetic data for various types of signal and image modalities such as ultrasound images, ecg and audio signals which further improved the performance of various models. This resulted in technology-transfer and subsequent writing of tech and exploratory notes.
Also performed statistical analysis in the detection of outliers over patients data and subsequently proposed novel methodologies in temperature distribution of human body and suggested improvements.

LNMIIT, Jaipur Feb 2019 - October 2021
Assistant Professor

VMWare Software India Pvt. Ltd. Aug 2013 - July 2014
Member of technical staff in file system group *Bengaluru*
Developed and implemented C code in file system domain

National Institute of Technology, Jaipur Jan 2010 - May 2010 and July 2010 - Dec 2010
Guest Faculty
Subjects Taught: Digital Signal Processing, Signals & Systems and C programming.

Conexant Systems Pvt. Ltd. July 2007- September 2007
Software Engineer *Hyderabad*
Worked on system programming as a trainee

PROGRAMMING SKILLS

C, MATLAB, Python, Pytorch

PUBLICATIONS

(Google Scholar profile: https://scholar.google.co.in/citations?hl=en&user=CXTb200AAAAJ)

1. *UnSegMedGAT: Unsupervised Medical Image Segmentation Using Graph Attention Networks Clustering*
   With A. Mudit Adityaja, and Saurabh Shigwan
   IEEE International Symposium on Biomedical Imaging (ISBI) 2025, Houston, TX, USA.

2. *UnSeGArmaNet: Unsupervised Image Segmentation using Graph Neural Networks with Convolutional ARMA Filters*
   With Kovvuri Sai Gopal Reddy, Saran Bodduluri, A. Mudit Adityaja, Saurabh Shigwan and Snehasis Mukherjee
   British Machine Vision Conference (BMVC) 2024, Glasgow, UK. **(CORE ranking: A, Acceptance Rate: 25.88%)**

3. *SimSAM: Simple Siamese Representation-Based Semantic Affinity Matrix for Unsupervised Image Segmentation*
   With Chanda Grover Kamra, Indra Deep Mastan, Debayan Gupta
   IEEE International Conference on Image Processing (ICIP) 2024, Abu Dhabi. (**Podium Presentation, Graduate Student Travel Award**)

4. *Semi-Supervised Robust Mixture Models in RKHS for Abnormality Detection in Medical Images*
   With Suyash P. Awate
   IEEE Transactions on Image Processing (TIP) 2020. **(CORE ranking: A*, I.F.: 11.041)**

5. *Semi-Supervised Robust One-Class Classification in RKHS for Abnormality Detection in Medical Images*
   With Ajit V. Rajwade, Sharat Chandran, Suyash P. Awate
   IEEE ICIP 2019, Taipei, Taiwan.

6. *Kernel Generalized Gaussian and Robust Statistical Learning for Abnormality Detection in Medical Images*
   With Ajit V. Rajwade, Sharat Chandran, Suyash P. Awate
   IEEE ICIP 2017, Beijing, China. **(Top 10 (0.3%) finalists for Best Paper Award)**

7. *Kernel Generalized-Gaussian Mixture Model for Robust Abnormality Detection*
   With Ajit V. Rajwade, Sharat Chandran, Suyash P. Awate
   MICCAI 2017, Quebec City, Quebec, Canada. **(CORE ranking: A, Acceptance rate: 32%)**

8. *Text Simplification for Enhanced Readability*
   With Siddhartha Banerjee and C.E. Veni Madhavan
   IC3K-KDIR/KMIS 2013, Vilamoura, Algarve. **(Acceptance rate: 38%)**

COURSES TAUGHT

PG Level: Mathematical Structures for Engineers, Methods of Matrix Analysis and Computation, Computational Linear Algebra
UG Level: Discrete Mathematical Structures, Computational Linear Algebra, Computer Programming, Digital Signal Processing, Artificial Intelligence, Introduction to Probability and Statistics, Foundation of Data Science

PROJECTS GUIDANCE

Guided 9 B.Tech. students on projects in machine learning and image processing domains

PROFESSIONAL SERVICE

1. Review(ed/ing) papers for following Journal(s): IEEE Transactions on Medical Imaging (TMI) 2021, IEEE Transactions on Internet of Things 2021
2. Review(ed/ing) papers for following conferences: ICVGIP; NCC; MICCAI; BMVC

AWARDS & ACHIEVEMENTS

1. In top 10 (0.3%) finalists for Best Paper Award at IEEE International Conference on Image Processing (ICIP-2017)
2. Recipient of travel grants from MICCAI and MedImage (ICVGIP) societies for attending MICCAI-2017
3. ICIP student travel grant for attending ICIP-2017
4. AIR-51/1,36,027 (99.97 percentile) GATE-2011 in Computer Science & Engineering
5. AIR 8648, 1180 and 7194 at AIEEE-2002, AIEEE-2003 and IIT-JEE-2003