NITIN KUMAR

nitin.nazkani@gmail.com,nitin.kumar@philips.com; ph-+91-7499285755/9987961078

RESEARCH INTERESTS

Applied Machine Learning in Image Analysis and Signal Processing, Medical Image Computing, Computer Vision, Some Computational Aspects of Matrix Theory

EDUCATION

Doctor of Philosophy(PhD)

Computer Science & Engineering, **Indian Institute of Technology, Bombay** *July 2014 - March 2020 (Thesis Submitted May 2019)*

CGPA: 8.73/10

(Supervised by Prof. Suyash P. Awate and Prof. Ajit V. Rajwade and supported by Sun-Pharma Research India)

Developed novel algorithms for abnormality detection and segmentation in medical images belonging to various modalities such as histopathology, endoscopy, fundus imaging etc. The problems I had dealt with incorporated unsupervised and semi-supervised learning (based on expert-feedback). Towards this, novel robust KPCA based algorithms and its mixture models based variants were proposed.

Master of Engineering

Computer Science & Automation, **Indian Institute of Science, Bengaluru** *June 2013*

CGPA: 6.2/8 (Including project grade: A)

(Supervised by Prof. C.E. Veni Madhavan)

Bachelor of Technology

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

CGPA: 7.28/10

Higher Secondary Cerificate (HSC)

Science & Mathematics, **Instrumentation (IL) School, Kota** *July 2002*

CBSE Board

Percentage: 73.4%

Secondary School Cerificate (SSC)

Science, Mathematics, & History **Adarsh Vidya Mandir School, Jaipur** *July 2000*

RBSE Board

Percentage: 80.3%

EXPERIENCE

Philips Research, Bengaluru Nov 2021 - Present

Research Engineer II, Artificial Intelligence & Data Science Department

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 patientâ€™s 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. *SimSAM: Simple Siamese Representation-Based Semantic Affinity Matrix for Unsupervised Image Segmentation*
   With Chanda Grover Kamra, Indra Deep Mastan, Nitin Kumar, Debayan Gupta
   IEEE Conference on Image Processing (ICIP) 2024.

2. *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)**

3. *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.

4. *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)**

5. *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%)**

6. *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

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 2018; NCC 2019, 2020; MICCAI 2019, 2020; BMVC 2024

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