



SUBHAYAN MUKHERJEE

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[Research](#) | [LinkedIn](#) | [GitHub](#)

Educational qualification

- 2015 – 2020 **University of Alberta**, Edmonton, Canada
(Grad: April) 5th year **PhD** Candidate & R.A. (**Machine Learning & Vision**), **Computing Science**: GPA 4 / 4
- 2012 – 2014 **National Institute of Technology Karnataka (NITK)**, formerly **KREC**, Surathkal, India
M.Tech by Research in Information Technology (**Computer Vision**): GPA 8.33 / 10
- 2005 – 2009 **Heritage Institute of Technology** (autonomous), Kolkata, India
B.Tech in Information Technology (Final Year project on **Image Processing**): GPA 7.9 / 10

Industrial experience

- 2017 – 2018 **Consortium for Aerospace Research and Innovation in Canada (CARIC)**
MITACS Accelerate Research Intern at **3vGeomatics Inc**, Vancouver, Canada
Large-scale motion mapping of ground displacement with InSAR images: Developed the first ever Convolutional Neural Network-based filtering and point-wise signal quality quantification methodology for InSAR, and further improved it to CNN-guided generative modeling-based approach. Coding in Keras (Tensorflow-GPU) & Python.
- 2016 – 2017 **Dolby Laboratories Inc**, Sunnyvale, California, USA
Video Imaging Research Intern, Imaging Advanced Development group
Dolby Patent *US2017/0308996A1 on coding artifact reduction methods in HDR images.*
Dolby Vision codecs encapsulate traditional ones like AVC/HEVC, and provide HDR capability. However, banding artefacts need to be handled while displaying SDR content on HDR screens. Computationally constrained mobile GPU environments restrict use of traditional filtering-based methods. I developed a dithering-based solution. It operates on individual pixels and modulates noise injection based on slope of Inverse Tone Mapping curve. Use cases also include those where the input is quantized due to bit-depth conversion, but the unquantized original version is unavailable. I conducted subjective experiments on the Dolby Pulsar display to validate my method. Simulations/prototyping via MATLAB and implementations in the C programming language.
- 2014 – 2015 **Informatica Business Solutions Pvt Ltd**, Bangalore, India
Software Engineer, R&D (Product Development in Java), *Informatica Services Platform*
Product development in Informatica Core Technology Group, focusing on Informatica Services Platform. The ISP software modules are used by most Informatica software products. ISP is a collection of Application Program Interfaces written in Java. I was responsible for improving the performance of those API's & maintaining them.
- 2009 – 2011 **Infosys Ltd**, Bhubaneswar, India
Software Engineer (Mainframes, in Healthcare domain) for US-based insurance giant AETNA
(published article and mainframes software tool for effort savings in software development)

Software knowledge

Platforms Windows, Linux
Languages Python, C/C++,
 Java, MATLAB
Databases MySQL, Oracle
Utilities Git, Perforce

Libraries Keras (Tensorflow),
 Scikit-learn, Scikit-image,
 OpenCV, Numpy, Scipy
Applications VersionOne, Eclipse,
 Spyder, DevTrack

Languages

Bengali Native
English Second
Hindi Third
German Basic

Certifications

- ✓ Sun Certification: Java 2 Platform, Standard Edition 5.0 Programmer (SCJP 5.0) with 98% marks

- ✓ German Language: Ramakrishna Mission Institute of Culture, Golpark, Kolkata with 83% marks

Selected publications (First Author)

1. "Potential of deep features for opinion-unaware, distortion-unaware, no-reference image quality assessment", International Conference on Smart Multimedia (**Springer**), Dec 16-18, 2019, **San Diego, USA**
2. "CNN-based Real-Time Parameter Tuning for Optimizing Denoising Filter Performance", **16th ICIAR (Springer)**, 27th to 29th August 2019, **University of Waterloo, Canada**
3. "CNN-Based InSAR Coherence Classification", **17th IEEE Sensors**, Oct 28-31, 2018, **New Delhi, India**
4. "CNN-based InSAR Denoising and Coherence Metric", **17th IEEE Sensors**, Oct 28-31, 2018, **New Delhi, India**
5. "A Fast Segmentation-free Fully Automated Approach to White Matter Injury Detection in Preterm Infants", Medical and Biological Engg. & Computing (SCI Indexed, **Springer**, Impact Factor: **2.04**) Vol 57, Issue 1, pp 71-87
6. "Adaptive Dithering using Curved Markov-Gaussian Noise in the Quantized Domain for Mapping SDR to HDR Image", International Conference on Smart Multimedia (**Springer**), Aug 24-26, 2018, **Toulon, France**
7. "Highlighting Objects of Interest in an Image by Integrating Saliency and Depth", **23rd IEEE International Conference on Image Processing (ICIP 2016)**, **Phoenix, USA**, 25th to 28th September 2016
8. "Entropy-difference based Stereo Error Detection", **12th IEEE Image Video and Multidimensional Signal Processing (IVMSP 2016) workshop**, **Bordeaux, France**, 11th and 12th July 2016
9. "Depth-based Selective Blurring in Stereo Images Using Accelerated Framework", 3D Research (ESCI Indexed, **Springer**, CiteScore: **1.02**) Vol 5, Issue 3, September 2014
10. "A Hybrid Algorithm for Disparity Calculation from Sparse Disparity Estimates Based on Stereo Vision", **10th IEEE International Conference on Signal Processing and Communications (SPCOM)**, Indian Institute of Science (**IISc**), **Bangalore, India**, 22nd to 25th July 2014

Invited services to the research community

- **Reviewer** for Remote Sensing Letters (Taylor & Francis)
- **Reviewer** for Journal of Visual Communication and Image Representation (Elsevier)
- **Reviewer** for Egyptian Journal of Remote Sensing and Space Sciences (Elsevier)
- **Local Arrangements Chair**, 30th IEEE Conf. on Systems, Man & Cybernetics, Banff, Canada

Selected achievements & Awards

- Alberta Graduate Excellence Scholarship (CAD 12,000) from Government of Alberta, Canada
- Pansy and George Strange Graduate Scholarship (declined the offer due to Dolby internship)
- Runner-Up Certificate for Early Achievement Award (PhD) in Computing Science department
- Scored 98 percentile in the India Govt. sponsored GATE (Graduate Aptitude Test in Engineering) scholarship. This award fully covered all tuition and living expenses incurred during Master's
- 3rd in a national level C Programming Competition organized at Jadavpur University, Kolkata

Selected academic Projects

1. Opinion-unaware Distortion-unaware No-reference Image Quality Assessment using Deep Features
2. Detecting ground movements from InSAR satellite images using deep learning-based methods
3. Designing a hybrid approach to selective focusing of stereo images, using depth and saliency
4. Development of novel white matter injury detection method from preterm brain MR images
5. Design & validation of novel entropy-based confidence measure for stereo error detection
6. Development of a novel stereo depth extraction algorithm, its parallel implementation using CPU-GPU acceleration and depth-based selective blurring to simulate shallow Depth-of-Field
7. Satellite image clarity enhancement using clustering algorithms in Java