



SUBHAYAN MUKHERJEE

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

Educational qualification

- 2015 – 2020 **University of Alberta**, Edmonton, Canada
(Graduated) **PhD (Deep / Machine Learning, Computer Vision, Imaging), 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

- 7/2017 – **3vGeomatics Inc**, Vancouver, Canada
Present **Research Intern, Mitacs Accelerate (CARIC) + Collaborator**
- Machine / Deep Learning & Computer Vision techniques to enhance accuracy & speed of ground displacement monitoring using Interferometric Synthetic Aperture Radar (InSAR) satellite images:
 - Developed First ever Convolutional Neural Network (CNN)-based InSAR image filtering and pixel-wise Image Quality Analysis (IQA) methodology for InSAR, and improved it to CNN-guided generative modeling via GMM.
 - Implemented in Keras with Tensorflow-GPU back-end and Python, supported by the numpy, scipy, scikit-image, scikit-learn and matplotlib libraries, running on an Anaconda environment.
- 9/2016 – **Dolby Laboratories Inc**, Sunnyvale, California, USA
4/2017 **Video Imaging Research Intern**, Imaging Advanced Development group
Patent **US2017/0308996A1** on coding artifact reduction methods for High Dynamic Range (HDR) images.
- Developed First ever false contour masking method for computationally constrained mobile GPU environment using pixel-wise dithering and novel noise patterns, that works directly on quantized HDR images. It is modulated by the slope of Inverse Tone-Mapping curve. Moreover, I interpolated the curve using fewer points, without any perceptible quality degradation, improving the run time performance by four times.
 - Conducted subjective experiments on Dolby Pulsar professional reference monitor to validate my methods.
 - Simulations & prototyping done in MATLAB and implementations in the C language.
- 7/2014 – **Informatica Business Solutions Pvt Ltd**, Bangalore, India
7/2015 **Software Engineer, R&D (Product Development in Java), Informatica Services Platform**
- Java 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 in Java. I was responsible for improving the performance of those API's & maintaining them.
- 12/2009 **Infosys Ltd**, Bhubaneswar, India
– 8/2011 **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