



# SUBHAYAN MUKHERJEE

Edmonton, Alberta (Canada) | +1 587 501 3435 | [subhayan012@gmail.com](mailto:subhayan012@gmail.com)

[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

- 5/2020 – **Tetra Tech Inc**, Edmonton, Canada  
Present **Scientist II**, Track auto-inspection for Canadian National Railway | **Deep Learning, Computer Vision**
- 7/2017 – **3vGeomatics Inc**, Vancouver, Canada  
5/2020 **Research Intern**, Mitacs Accelerate (CARIC) + Collaborator | **Deep Learning, Computer Vision**
- 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 | **High Dynamic Range Imaging 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. Interpolated tone mapping using fewer points, without perceptible quality degradation, improving run time by four times.
  - 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 (ISP)
- 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. "An Unsupervised Generative Neural Approach for InSAR Phase Filtering and Coherence Estimation", **IEEE Geoscience and Remote Sensing Letters** (SCIE Indexed, Impact Factor: **3.53**) [ *accepted for publication* ]
2. "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**
3. "CNN-based Real-Time Parameter Tuning for Optimizing Denoising Filter Performance", **16<sup>th</sup> ICIAR (Springer)**, 27<sup>th</sup> to 29<sup>th</sup> August 2019, **University of Waterloo, Canada**
4. "CNN-Based InSAR Coherence Classification", **17<sup>th</sup> IEEE Sensors**, Oct 28-31, 2018, **New Delhi, India**
5. "CNN-based InSAR Denoising and Coherence Metric", **17<sup>th</sup> IEEE Sensors**, Oct 28-31, 2018, **New Delhi, India**
6. "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
7. "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**
8. "Highlighting Objects of Interest in an Image by Integrating Saliency and Depth", **23<sup>rd</sup> IEEE International Conference on Image Processing (ICIP 2016)**, **Phoenix, USA**, 25<sup>th</sup> to 28<sup>th</sup> September 2016
9. "Entropy-difference based Stereo Error Detection", **12<sup>th</sup> IEEE Image Video and Multidimensional Signal Processing (IVMSP 2016) workshop**, **Bordeaux, France**, 11<sup>th</sup> and 12<sup>th</sup> July 2016
10. "Depth-based Selective Blurring in Stereo Images Using Accelerated Framework", **3D Research** (ESCI Indexed, **Springer**, CiteScore: **1.02**) Vol 5, Issue 3, September 2014
11. "A Hybrid Algorithm for Disparity Calculation from Sparse Disparity Estimates Based on Stereo Vision", **10<sup>th</sup> IEEE International Conference on Signal Processing and Communications (SPCOM)**, **Indian Institute of Science (IISc), Bangalore, India**, 22<sup>nd</sup> to 25<sup>th</sup> 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**, 30<sup>th</sup> 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
- 3<sup>rd</sup> 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