SUBHAYAN MUKHERJEE

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Educational qualification

2015 – 2020 (Graduated) **University of Alberta**, Edmonton, Canada
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 – Present **Tetra Tech Inc**, Edmonton, Canada
***Scientist II*,** Track auto-inspection for Canadian National Railway **| Deep Learning**, **Computer Vision**

7/2017 – 5/2020 **3vGeomatics Inc**, Vancouver, Canada
***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 – 4/2017 **Dolby Laboratories Inc**, Sunnyvale, California, USA
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 – 7/2015 **Informatica Business Solutions Pvt Ltd**, Bangalore, India
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 – 8/2011 **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	Spyder, Eclipse, Visual Studio, VersionOne

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**th ICIAR (**Springer**), 27th to 29th August 2019, **University of Waterloo**, **Canada**
4. "CNN-Based InSAR Coherence Classification", **17**th **IEEE** Sensors, Oct 28-31, 2018, **New Delhi, India**
5. "CNN-based InSAR Denoising and Coherence Metric", **17**th **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", **23rd IEEE** International Conference on Image Processing (**ICIP** 2016), **Phoenix**, **USA**, 25th to 28th September 2016
9. "Entropy-difference based Stereo Error Detection", **12th IEEE** Image Video and Multidimensional Signal Processing (**IVMSP** 2016) workshop, **Bordeaux**, **France**, 11th and 12th 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", **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