SUBHAYAN MUKHERJEE

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Educational qualification

2015 – 2020 (**Grad**: April)
University of Alberta, Edmonton, Canada
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
3vGeomatics Inc, Vancouver, Canada
Research Intern, *Mitacs Accelerate* + **C**onsortium of **A**erospace **R**esearch & **I**nnovation in **C**anada

• Machine / Deep Learning & Computer Vision techniques to enhance accuracy & speed of ground displacement monitoring using Inteferometric 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.

2016 – 2017
Dolby Laboratories Inc, Sunnyvale, California, USA
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.

2014 – 2015
Informatica Business Solutions Pvt Ltd, Bangalore, India
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.

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", **16**th ICIAR (**Springer**), 27th to 29th August 2019, **University of Waterloo**, **Canada**
3. "CNN-Based InSAR Coherence Classification", **17**th **IEEE** Sensors, Oct 28-31, 2018, **New Delhi, India**
4. "CNN-based InSAR Denoising and Coherence Metric", **17**th **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