

# Subhayan Mukherjee

\*willing to relocate for US positions

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## SKILLS

### CODING LANGUAGES

C / C++ • Python • Matlab • Java

### ML / CV LIBRARIES

Keras (Tensorflow) • OpenCV  
Scikit-Learn • Scikit-Image  
Numpy • Scipy • Tesseract OCR

### DATABASES

MySQL • Oracle

### PLATFORMS

Windows • Linux (Ubuntu)

### DEV ENVIRONMENTS

Visual Studio • Spyder • Eclipse

### VERSION CONTROL

Git • Perforce

### BUILD MANAGEMENT

CMake • Maven

### PACKAGE MANAGEMENT

Anaconda • pip • vcpkg • APT

## EDUCATION

### UNIVERSITY OF ALBERTA

PHD | COMPUTER SCIENCE

MACHINE LEARNING • COMPUTER

VISION • SIGNAL PROCESSING

2015 - 2020 | Edmonton, CA

GPA: 4.0 / 4.0

### NATIONAL INST. OF TECH.

M-TECH | COMPUTER VISION

STEREO DEPTH ESTIMATION

2012 - 2014 | Surathkal, IN

GPA: 8.33 / 10.0

### HERITAGE INST. OF TECH.

B-TECH | SIGNAL PROCESSING

2005 - 2009 | Kolkata, IN

Major GPA: 8.16 / 10.0

## PROFILE LINKS

[linkedin.com/in/subhayanmukherjee](https://www.linkedin.com/in/subhayanmukherjee)

[github.com/subhayanmukherjee](https://github.com/subhayanmukherjee)

[Publications Link](#) | [Portfolio Link](#)

## COMMUNICATION

Bengali	Native or bilingual
English	Full professional
German	Elementary

## SUMMARY

- 3+ yrs. exp. in industrial and internship settings where end to end machine learning and computer vision pipelines are productionized and productized.
- Designed machine learning systems that can process large volumes of data.
- Designed systems that run on-edge or in compute restrained environments.
- 3 years software engineering experience with code deployed in production.
- Start-up experience with rapid prototyping, experimentation and execution.
- Sound in fundamentals of machine learning, deep learning, computer vision.
- Self-motivated, detail-oriented and accountable quick learner; able to work independently and in a team on all aspects of the software when called upon.

## EXPERIENCE

### TETRA TECH | SOFTWARE DEVELOPER LEVEL 2 (SCIENTIST II)

- Deep Learning • Computer Vision May 2020 - Present | Edmonton, CA
- High performance pattern segmentation on Depth data via Multi-Threading.
- Real-time feature extraction, object detection, localization and classification.
- Optical Character Recognition using LSTM trained on real & synthetic data.
- Script based reusable processing pipelines for rapid re-training & iteration.

### 3VGEOMATICS | RESEARCH INTERN + UNIVERSITY COLLABORATOR

- Deep Learning • Computer Vision Jul 2017 - May 2020 | Vancouver, CA
- Extremely scalable filtering and per-pixel quality analysis for radar imagery.
- Research and prototype new unsupervised learning approaches to perform inference at scale on petabytes of unlabeled radar data using CNNs & GMMs.
- Reading and implementing current research papers on machine learning & computer vision; Understanding mathematical foundations of the algorithms.

### DOLBY LABS | VIDEO IMAGING RESEARCH INTERN

- HDR Patent US2017/0308996A1 Sep 2016 - Apr 2017 | Sunnyvale, US
- Research and prototype high dynamic range (HDR) image enhancement for embedded platforms through perceptual masking of quantization artefacts.
- Accelerating tone mapping interpolation via fewer points without artefacts.
- Subjective experiments on reference monitors using different color spaces.

### SOFTWARE ENGINEERING | SYSTEMS / SOFTWARE ENGINEER R&D

- Informatica (Java API development) Jul 2014 - Jul 2015 | Bangalore, IN
- Infosys (Mainframes development) Dec 2009 - Aug 2011 | Bhubaneswar, IN

## AWARDS

- |      |                                                                                     |
|------|-------------------------------------------------------------------------------------|
| 2019 | Graduate Excellence Scholarship (CAD 12,000) funded by Alberta Govt.                |
| 2017 | Pansy and George Strange Graduate Scholarship (declined the offer)                  |
| 2016 | Runner-Up Certificate, PhD Early Achievement Award, Computer Science                |
| 2012 | 98 %tile in Graduate Aptitude Test in Engineering (Govt. funded M-Tech)             |
| 2007 | 3 <sup>rd</sup> in pan-India C Programming contest organized by Jadavpur University |

## JOURNAL ARTICLES

S. Mukherjee, A. Zimmer, X. Sun, P. Ghuman, and I. Cheng, "An unsupervised generative neural approach for insar phase filtering and coherence estimation," *IEEE Geoscience and Remote Sensing Letters*, vol. (Early Access), pp. 1–5, July 2020.

S. Mukherjee, I. Cheng, S. Miller, T. Guo, V. Chau, and A. Basu, "A fast segmentation-free fully automated approach to white matter injury detection in preterm infants," *Medical & Biological Engineering & Computing*, vol. 57, pp. 71–87, July 2018.

## PHD PROJECTS

### **DEEP FEATURES FOR IMAGE QUALITY ASSESSMENT** • Kernel Density Estimation • Auto-Encoders

- Opinion-Unaware, Distortion-Unaware, No-Reference IQA using learned deep features instead of hand-crafting.
- Unsupervised learning of image quality features from pristine images dataset using Convolutional Autoencoder.
- Non-parametric pristine image model built by fitting arbitrary feature distributions via Kernel Density Estimation.

### **STEREO DEPTH ESTIMATION FOR SALIENT OBJECT DETECTION** • Compute-Efficient Stereo Depth

- Stereo disparity estimation based on interpolation from sparse disparity estimates on image segment boundaries.
- Disparity & Saliency used to predict Regions-of-Interest using GPUs and Multi-threaded fast parallel computation.

### **CNN-BASED PARAMETER-TUNING OF NOISE FILTER** • Collaborative Filtering • Real-Time Conv-Net

- Image-based prediction of 3D decorrelating unitary transform coefficient threshold for stacks of matched blocks.
- Shallow Neural Network architecture with Separable Convolutions for fast convergence and real-time prediction.

### **LESION DETECTION FROM PRETERM INFANT BRAIN MRI** • Genetic Algorithms • Outlier Detection

- Brain ventricle detection as optimal set of candidate blobs via Genetic Algorithm. Sampling brain white matter in ventricle vicinity. Detecting lesions as outliers in white matter intensity distribution based on Gaussian assumption.