

# ARITRA CHOWDHURY

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## EDUCATION

- **Ph.D. in Computer Science**, Rensselaer Polytechnic Institute, Troy, New York, U.S.A.
- Expected Graduation date: May 2018, CGPA: 3.71
- **M.S. in Computer Science**, Rensselaer Polytechnic Institute, Troy, New York, U.S.A.
- Graduation Date: May 2016, CGPA: 3.71
- **B.E in Electronics and Telecommunication Engineering**, Jadavpur University, Kolkata, India.
- Graduation date: June 2013, CGPA: 3.58

## INTERNSHIPS AND TRAINING

- *IBM Research, Almaden, CA (Summer internship, May 2017-Aug 2017)*
  - Reduced annotation burden in cell segmentation tasks by using active learning with convolutional neural networks.
  - Paper under submission at *MICCAI 2018*. ([paper](#))
- *GE Global Research Center, Niskayuna, NY (Summer internship, May 2016-Aug 2016)*
  - Built artificial parametric 3D models of blood vessels for performing data augmentation on neuropathological image samples for blood vessel characterization using Convolutional neural networks.
  - Paper published at *ISBI 2017*. ([paper](#))
  - US Patent under submission.

## PROJECTS

- **Scientific discovery and learning using a human in the loop architecture (Aug 2017-Present):**
  - Helped build the backend of a cognitive immersive systems laboratory (CISL) in collaboration with IBM Research for performing scientific discovery and learning.
  - This project involved building a computational system for breast cancer diagnosis involving human-computer interaction. ([poster](#))
- **Image driven machine learning methods for microstructure recognition (Sep 2015-June 2016):**
  - Performed extensive experimentation to find the best set of algorithms (feature extraction, dimensionality reduction and classification) and corresponding hyper-parameters for performing microstructure recognition.
  - This is a project in collaboration with the Material Science department at RPI. ([paper](#))
- **Quantification of noise in medical images (Aug 2015-Dec 2015):**
  - Built a computational tool, which quantifies image quality with the help of state of the art machine learning techniques.
  - Collaboration on this project is with GE Global Research Center, Niskayuna, NY. ([paper](#))
- **Character recognition (May 2014-Aug 2014):**
  - Helped build a computational model for character recognition and machine translation of an ancient Chinese language called Nyushu.
  - This project was pursued in collaboration with the Natural Language Processing group at Rensselaer Polytechnic Institute. ([paper](#))

## TECHNICAL SKILLS

- Programming Language: Python (Advanced), MATLAB (Prior experience), C++ (Prior experience)
- Packages: Caffe (Prior experience), Keras, Theano, Sklearn, Skimage
- Operating System: Windows, Linux, OSX
- Areas: Machine learning, computer vision, biomedical image analysis, deep learning

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## PUBLICATIONS

- Aritra Chowdhury et al., "[Active deep learning reduces annotation burden in automatic cell segmentation](#)", *BioRxiv 2017* (submitted to *MICCAI 2018*).
- Aritra Chowdhury et al., "[Blood vessel characterization using virtual 3D models and convolutional neural networks in fluorescence microscopy](#)", *IEEE ISBI*, 2017.
- Aritra Chowdhury, Alberto Santamaria-Pang, Christopher J. Sevinsky, Bülent Yener, "[A computational study on convolutional feature combination strategies for grade classification in colon cancer using fluorescence microscopy data](#)", *SPIE Medical Imaging Conference*, 2017.
- Aritra Chowdhury, Elizabeth Kautz, Bülent Yener, Daniel Lewis, "[Image driven machine learning methods for microstructure Recognition](#)", *Computational Materials Science, Elsevier*.
- Aritra Chowdhury, Kareem S. Aggour, Steven M. Gustafson, Christopher J. Sevinsky, Bülent Yener, "[A Machine Learning Approach to Quantifying Noise in Medical Images](#)", *SPIE Medical Imaging Conference*, 2016.
- Tongtao Zhang, Aritra Chowdhury, Nimit Dhulekar, Jinjing Xia, Kevin Knight, Heng Ji, Bulent Yener and Liming Zhao, "[From Image to Translation: Processing the Endangered Nyushu Script](#)" *ACM Transactions on Asian and Low-Resource Language Information Processing*.
- Aritra Chowdhury, Swagatam Das, "[Automatic shape independent clustering based on ant dynamics](#)." *Swarm and Evolutionary Computation, Elsevier*.
- D. Maity, A. Chowdhury, S. Surender Reddy, B. K. Panigrahi, A.R. Abhayankar, M. K. Mallick "[Joint Energy and Spinning Reserve Dispatch in Wind-Thermal Power System Using IDE-SAR Technique](#)." *Symposium Series on Computational Intelligence*, 2013, *IEEE*.
- Arghya Sur, Aritra Chowdhury, Jaydeep Ghosh Chowdhury, Swagatam Das, "[Automatic Clustering based on Cluster Nearest Neighbour Distance Algorithm](#)." *Frontiers in Intelligent Computing Theory and Applications Conference 2012, Springer*.
- Jaydeep Ghosh Chowdhury, Aritra Chowdhury, Arghya Sur, Swagatam Das, "[Design of Non-uniform Circular Antenna Arrays using Coordinated Bacterial Dynamics and Opposite Numbers](#)." *Swarm, Evolutionary and Memetic Computing Conference 2012, Springer*.
- Jaydeep Ghosh Chowdhury, Aritra Chowdhury, Arghya Sur, "[Large Scale Optimization based on Coordinated bacterial Dynamics and Opposite numbers](#)." *Swarm, Evolutionary and Memetic Computing Conference 2012, Springer*.
- Aritra Chowdhury, Sandip Bose, Swagatam Das, "[Automatic Clustering based on Invasive Weed Optimization Algorithm](#)." *Swarm, Evolutionary and Memetic Computing Conference 2011, Springer*.