**ARITRA CHOWDHURY**

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**EDUCATION**

* **Ph.D. in Computer Science**, Rensselear Polytechnic Institute, Troy, New York, U.S.A.
* Expected Graduation date: May 2018**,** CGPA: 3.71
* **M.S. in Computer Science**, Rensselear 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 *ISBI 2018*. ([paper](http://www.cs.rpi.edu/~achowd/ISBI_2018.pdf))
* *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](http://ieeexplore.ieee.org/document/7950599/?reload=true))
		- 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](http://www.cs.rpi.edu/~achowd/poster1.pdf))

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](http://www.sciencedirect.com/science/article/pii/S0927025616302695))

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](https://www.spiedigitallibrary.org/conference-proceedings-of-spie/9791/1/A-machine-learning-approach-to-quantifying-noise-in-medical-images/10.1117/12.2217702.full))
* 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](https://dl.acm.org/citation.cfm?id=2857052))

**TECHNICAL SKILLS**

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

**PUBLICATIONS**

* Aritra Chowdhury et al., “[Active deep learning reduces annotation burden in automatic cell segmentation](https://www.biorxiv.org/content/early/2017/11/01/211060)”, *BioRxiv 2017* (submitted to *ISBI 2018*).
* Aritra Chowdhury et al., “[Blood vessel characterization using virtual 3D models and convolutional neural networks in fluorescence microscopy](http://ieeexplore.ieee.org/document/7950599/?reload=true)”, *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](https://www.spiedigitallibrary.org/conference-proceedings-of-spie/10140/101400Q/A-computational-study-on-convolutional-feature-combination-strategies-for-grade/10.1117/12.2255687.short?fileName=101400Q)”, *SPIE Medical Imaging Conference, 2017*.
* Aritra Chowdhury, Elizabeth Kautz, Bülent Yener, Daniel Lewis, “[Image driven machine learning methods for microstructure Recognition](http://www.sciencedirect.com/science/article/pii/S0927025616302695)”, *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](https://www.spiedigitallibrary.org/conference-proceedings-of-spie/9791/1/A-machine-learning-approach-to-quantifying-noise-in-medical-images/10.1117/12.2217702.full)”, *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](http://dl.acm.org/citation.cfm?id=2857052)” *ACM Transactions on Asian and Low-Resource Language Information Processing.*
* Aritra Chowdhury, Swagatam Das, ”[Automatic shape independent clustering based on ant dynamics.](http://www.sciencedirect.com/science/article/pii/S2210650211000563)” *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](http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6615191&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxpls%2Fabs_all.jsp%3Farnumber=6615191).” *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.](http://rd.springer.com/chapter/10.1007/978-3-642-35314-7_22)” *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.](http://link.springer.com/chapter/10.1007/978-3-642-35380-2_90)” *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.](http://link.springer.com/chapter/10.1007/978-3-642-35380-2_87)” *Swarm, Evolutionary and Memetic Computing Conference 2012, Springer.*
* Aritra Chowdhury, Sandip Bose, Swagatam Das,” [Automatic Clustering based on Invasive Weed Optimization Algorithm.](http://rd.springer.com/chapter/10.1007/978-3-642-27242-4_13)” *Swarm, Evolutionary and Memetic Computing Conference 2011, Springer.*