

MD ABDUL AOWAL

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RESEARCH INTERESTS

Deep Learning, Computer Vision, Machine Learning, Statistical Signal Processing

EDUCATION

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| Bangladesh University of Engineering and Technology Master of Science (M.Sc.), Information and Communication Technology | <i>Expected - February '19</i> <i>GPA : 3.50/4.00</i> |
| Bangladesh University of Engineering and Technology Bachelor of Science (B.Sc.), Electrical and Electronics Engineering | <i>March '09 - July '14</i> <i>GPA : 3.39/4.00</i> |

RESEARCH PUBLICATION ([📖 Google Scholar](#))

- [1] Islam, M. T., **Aowal, M. A.**, Minhaz, A. T., and Ashraf, K. "Abnormality Detection and Localization in Chest X-Rays using Deep Convolutional Neural Networks," *arXiv preprint arXiv:1705.09850*. [pdf]
- [2] **Aowal, M. A.**, Zaman, A. S., Rahman, S. M., and Hatzinakos, D. "Static Hand Gesture Recognition Using Discriminative 2D Zernike Moments," In: *Proceedings of IEEE TENCON, IEEE Region 10 Conference, Bangkok, Thailand, 2014, pp. 1-5*. [DOI][pdf]

INDUSTRY EXPERIENCE

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|---|----------------------------------|
| Computer Vision Researcher, Semion Ltd. | <i>January '17 - Present</i> |
| Planning Specialist(BSS), Banglalink Digital Communications Ltd. | <i>October '14 - July '16</i> |
| Programmer(Intern), M2M Solutions & Services Ltd. | <i>March '13 - September '13</i> |

SELECTED PROFESSIONAL PROJECTS

Deep Learning Based Abnormality Detection and Localization in Chest X-Rays

- Achieved SOTA result in Indiana dataset using an ensemble of different DNN architectures
- Improved existing object detection architectures for nodule(small object) localization
- Trained different DNN architectures in distributed mode(MaTEx, Intel MKL, Horovod)
- Developed a server based image annotation tool that supports PASCAL VOC format export(*Javascript*)

Breast Cancer Classification from Histopathological Images Using DenseNet

- Achieved SOTA result irrespective of magnification level on BreakHis dataset using DenseNet

SemInfer: A Desktop Application to Run Inference on a Captured Screen-shot(C++)

- Developed a zero dependency DNN framework in C++11 to run inference
- Added data parallelism support with OpenMP and SIMD instructions
- Available Blocks: Conv, FC, Pooling, Residual, Dense, Depthwise Conv, RPN, ROI Pool, NMS

SemRad: A Teleradiology Solution(*Java, JavaFX, SQLite, MySQL*)

- Designed separate desktop App connected with a server for hospital and radiologist to transfer studies
- Developed radiologist app with all necessary tools especially Multiplanar Reconstruction for CT

GPS Based Location Tracker(C++, PHP, CodeIgniter, MySQL, jQuery)

- Developed firmware for tracker along with a web application to monitor location in Google Map

SELECTED ACADEMIC PROJECTS

- Deep Learning on Orthogonal Moment-Based Patches for Fingerprint Classification *M.Sc. Thesis*
- Multi-client distributed password cracking system (*Unix C*) *Distributed System*
- DES implementation in ECB or CBC mode (*Java*) *Applied Cryptography*
- FDM-based Electromagnetic Simulator (*MATLAB*) *Numerical Analysis*
- Automatic Packaging System for Automation in Industry (*Embedded C*) *Control System*
- Microcontroller based Electronic/Digital Piano (*Embedded C*) *Microprocessor Lab*
- Simulation of an 8 Bit Computer capable of executing 16 Instructions(*Proteus*) *Microprocessor Theory*
- AM Radio Receiver (*Hardware Project*) *Communication Lab*

SELECTED COMPETITIONS

- Ranked 25th among 404 participants in MAFAT Challenge - Fine-Grained Classification of Objects from Aerial Imagery(public leaderboard) *[competition website]*
- Advanced to Round 3 in Topcoder TCO18 Algorithm Competition(Top 10%) *[competition website]*
- Ranked 12th out of 57 teams in Kaggle Bengali Handwritten Digit Recognition *[kaggle]*

RELEVANT COURSEWORK

- **Graduate** - Statistical Machine Translation | Data Mining | Distributed Systems | Applied Cryptography | Information and Cyber Security | Advanced Networking
- **Undergraduate** - Digital Signal Processing | Continuous Signal and Linear Systems | Random Signals & Process | Probability and Statistics | Linear Algebra | Calculus I | Calculus II | Computer Programming | Computer Networks | Communication Theory | Control System

COMPUTER SKILLS

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|------------------------------|---|
| Programming Languages | C++, Python, Java, MATLAB, R, Shell Scripting |
| DL Frameworks | Tensorflow, Keras, PyTorch, Caffe |
| Python Packages | OpenCV, Pandas, Numpy, Scipy, Matplotlib, BeautifulSoup |
| Web Development | PHP, Laravel, CodeIgniter, Javascript, jQuery, MySQL, Django |
| Other Expertise | Git, Vim, Weka, Latex, PSpice, Proteus, Quartus II, Packet Tracer |

ACADEMIC HONORS AND AWARDS

- University Admission Test Excellency Scholarship
- Education Board Scholarship by Ministry of Education for excellence in H.S.C. & S.S.C. Examination

EXTRA-CURRICULAR

- Presented a paper in the 35th IEEE TENCON, Bangkok, Thailand(October '14)
- Acted as Vice-President of Notre Dame Nature Study Club (NDNSC) (July '07 - June '09)
- Sports: Team member of semi-finalist team in Rag Football championship-'14 & Inter-hall football championship; Avid player of Cricket, Badminton, Table-tennis as well

REFERENCES

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