FAHIM IRFAN ALAM

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Date of Birth: 26 October 1984
Residency Status in Australia: Permanent Resident
Citizenship Application: Approved (Waiting for Ceremony)

LinkedIn Profile
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SUMMARY

I've had a serious interest in Computer Vision and Machine Learning research since 2009, and I've been actively working in these fields since then. I am a proud PhD graduate of Griffith University in Australia, where I achieved several noteworthy results in hyperspectral image processing, notably in the field of remote sensing. To continue my PhD research, I'm now looking for innovative ideas for solving more significant concerns in the Hyperspectral Image community. Other related topics in Computer Vision, such as medical image processing, have recently piqued my attention to contribute to the biomedical community.

EDUCATION

July 2014 – July 2019 ***Griffith University*** Brisbane, Australia

- **Degree:** *Doctor of Philosophy (PhD) in Computer Science*
- **Concentration:** *Hyperspectral Remote Sensing Image Analysis with Deep Learning*
- Recipient of ***Griffith University Postgraduate Research Scholarship***
- **Thesis Topic:** *Deep Feature Learning for Spectral-Spatial Classification of Hyperspectral Remote Sensing Images*
- **Area of Study:** *Remotely sensed hyperspectral image analysis*
- Delegated as **PhD Research Scholar** and worked intensively in development of novel ***Deep Learning*** models incorporated to hyperspectral imaging data obtained through designated devices.
- Conducted weekly programming labs as a **Teaching Assistant (TA)** for the following courses: 1807ICT Programming Fundamentals, 2807ICT Programming Principles, 1809ICT Software Engineering Fundamentals and 1804ICT Data Management.
- Additionally, as a **Teaching Assistant (TA)**, I demonstrated lab and grading weekly assignments, supervised programming projects written in Python, Supervised Software engineering projects written in Java and C# and grading accordingly.

September 2009 - December 2011 ***St. Francis Xavier University*** Nova Scotia, Canada

- **Degree**: Master of Science in Computer Science
- **Concentration:** *Machine Learning and Computer Vision*
- **Supervisor:** Professor Dr. Iker Gondra, St. Francis Xavier University
- Recipient of Research Assistant Scholarship
- **Thesis Topic:** *Learning Spatial Relations For Object-Specific Segmentation Using Bayesian Network Model*
- Demonstrated lab lectures as **Teaching Assistant** related to fundamental and advanced programming concepts, demonstrating laboratory tasks and grading weekly assignments for the courses:
  - Computer Programming in C
  - Programming and Data Structures
  - Advanced Data Structures
  - Operating System

June 2002 - December 2007	*Chittagong University*	Chittagong, Bangladesh

- **Degree:** Bachelor of Science in Computer Science and Engineering
- **Concentration:** *Machine Learning and Image Processing*
- Honors with distinction (CGPA 3.78 out of 4.00)
- **Thesis Topic:** Spatial Feature Extraction using Knowledge Discovery

RESEARCH AND TEACHING INTEREST

- Deep Learning
- Machine Learning
- Artificial Intelligence
- Computer Vision
- Image Processing
- Computer Networks
- Pattern Recognition

RESEARCH PROJECTS

CURHS Autumn Research Internship Program 2020   October 2020 – April 2021

Under the Chittagong University Research and Higher Studies (CURHS) Autumn Research Internship Program 2020, I supervised a project titled "Exploring Segmentation and Classification to Facilitate Effective Detection of Breast Cancer from Ultrasound Images". The project theme was Deep Learning in Computational biology & Bioinformatics as the area is current significantly relevant and demanding in the machine learning community. In this project, I supervised two students who developed their individual algorithms in breast cancer diagnosis from Ultrasound images. Both contributions are now under review for publication. One of the contributions had been deemed as significant and has been accepted in the Journal named "Biomedical Signal Processing and Control" which is one of the most reputed journals in Mathematical & Computational Biology in Elsevier.

SELECTED RESEARCH PUBLICATION

JOURNALS

[1] Inan, M.S.K., **Alam, F.I.** and Hasan, R., 2022. "*Deep Integrated Pipeline of Segmentation Guided Classification of Breast Cancer from Ultrasound Images*". Biomedical Signal Processing and Control, Elsevier. **(Accepted for publication)**

[2] **Fahim Irfan Alam**, Jun Zhou, Alan Wee-Chung Liew, Xiuping Jia, Jocelyn Chanussot, Yongsheng Gao. "Conditional Random Field and Deep Feature Learning for Hyperspectral Image Segmentation." IEEE Transactions on Geoscience and Remote Sensing, Vol. 57, No. 3, pages 1612-1628, 2019.

[3] **F. I. Alam**, M. I. H. Chowdhury and M. R. Rabbani. "A Prediction Model to support Multilayer Network-based Universal Electronic Cash Transaction Framework." Smart Computing Review. Volume 3 Issue 4, 246-260, 2013.

[4] I. Gondra and **F. I. Alam**. "Learning Spatial Relations for Object-Specific Segmentation Using Bayesian Network Model." Signal, Image and Video Processing (Springer), 8(8):1441-1450 (2014).

[5] **F. I. Alam** and R. U. Faruqui. "Optimized Calculations of Haralick Texture Features." European Journal of Scientific Research. Vol.50 No.4 (2011), 543-553.

CONFERENCES

[1] Rizwan Hasan, Sohrab Hossain, **Fahim Irfan Alam** and Mannpreet Barua. "Bangla Music Genre Classification Using Fast and Scalable Integrated Ensemble Boosting Framework", 3rd International Conference on Sustainable Technologies for Industry 4.0, (STI-2021), Bangladesh, 2022.

[2] Muhammad Sakib Khan Inan, Rizwan Hasan and **Fahim Irfan Alam**. "A Hybrid Probabilistic Ensemble based Extreme Gradient Boosting Approach For Breast Cancer Diagnosis", 11th Annual Computing and Communication Workshop and Conference (CCWC), USA, 2021.

[3] Muhammad Sakib Khan Inan, Rubaiath E Ulfath, **Fahim Irfan Alam**, Fateha Khanam Bappee and Rizwan Hasan. "Improved Sampling and Feature Selection to Support Extreme Gradient Boosting For PCOS Diagnosis", 11th Annual Computing and Communication Workshop and Conference (CCWC), USA, 2021.

[4] **Fahim Alam**, Jun Zhou, Alan Wee-Chung Liew, Jun Jo and Yongsheng Gao, "Triplet Constrained Deep Feature Extraction for Hyperspectral Image Classification," 2018 9th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS), Amsterdam, Netherlands, 2018, pp. 1-5.

[5] **Fahim Alam**, Jun Zhou, Lei Tong, Alan Wee-Chung Liew, and Yongsheng Gao. "Combining unmixing and deep feature learning for hyperspectral image classification", International Conference on Digital Image Computing: Techniques and Applications (DICTA'17), 2017, pp. 1-7.

[6] **Fahim Irfan Alam**, Jun Zhou, Alan Wee-Chung Liew, and Xiuping Jia. "CRF learning with CNN features for hyperspectral image segmentation", Proceedings of the IEEE International Geoscience & Remote Sensing Symposium (IGARSS'16), pages 6890-6893, Beijing, China, 2016.

[7] M. I. H. Chowdhury and **F. I. Alam**, "A probabilistic approach to support Self-Organizing Map (SOM) driven facial expression recognition," Computer and Information Technology (ICCIT), 2014 17th International Conference on, Dhaka, 2014, pp.210-216.

[8] **F. I. Alam**, M. I. H. Chowdhury, M. R. Rabbani and F. K. Bappee. "An Optimized Image Segmentation Algorithm." Proceedings of the Informatics, Electronics and Vision (ICIEV 13), Dhaka, Bangladesh, May 2013. (Awarded as Best Paper)

[9] **F. I. Alam** and B. Banik. "Offline Isolated Bangla Handwritten Character Recognition Using Spatial Relationships." Proceedings of the Informatics, Electronics and Vision (ICIEV 13), Dhaka, Bangladesh, May 2013.

[10] **F. I. Alam** and M. I. H. Chowdhury. "A Multilayer Network-supporting Universal Electronic Cash Transaction Framework." Proceedings of the Computer and Information Technology (ICCIT12), pp. 362-368, Chittagong, Bangladesh, December 2012.

[11] **F. I. Alam**, F. K. Bapee, M. R. Rabbani and M. M. Islam. "An optimized Formulation of Decision Tree Classifier." Proceedings of 2013 Advances in Computing, Communication and Control, Mumbai, India, January 2013. Springer Lecture Notes in Communications in Computer and Information Science, vol. 361, pp. 105-118.

[12] I. Gondra and **F. I. Alam**. "Learning-Based Object Segmentation Using Regional Spatial Templates and Visual Features." Proceedings of 2012 International Conference on Computer Vision and Graphics (ICCVG12), Warsaw, Poland, September 2012. Springer Lecture Notes in Computer Science, vol. 7594, pp. 397-406.

F. I. Alam and I. Gondra. "Incorporating Shape into Spatially-Aware Adaptive Object Segmentation Algorithm." Proceedings of the C3S2E Conference (C3S2E 12), pp. 86-94, ACM, Montreal, Canada, June 2012.

FELLOWSHIPS AND AWARDS

- Recipient of Griffith University Postgraduate Research Scholarship.
- Recipient of Graduate Research Fellowship, St. Francis Xavier University (NSERC Discovery Grant).
- Merit Scholarship based on Secondary and Higher Secondary Examinations by University of Chittagong.
- Selected as Research Scholar for NSERC's several machine learning projects.
- Participated in ACM speed programming contest representing St. Francis Xavier University in 2010.

TEACHING EXPERIENCE

Associate Professor, *University of Chittagong*, Bangladesh   Feb 2008 - Present
- Taught several core courses of Computer Science, such as Programming with C/C++ and Java, Neural Networks /Deep Learning, Data Communication.
- Responsible for conducting lectures, examinations, and grading.
- Supervised undergraduate students in Software Development projects which are now fully functional and in for use by several departments at the University.

Adjunct Faculty, *Asian University for Women*, Bangladesh   Sep 2019 - Dec 2019
- Taught Harvard University's reputed course CS50 in AUW.

Adjunct Faculty, *East Delta University*, Bangladesh   Jan 2020 - Dec 2021
- Taught Neural Network & Fuzzy Logic/Deep Learning, Pattern Recognition/Machine Learning and Operating Systems. (Concerned lab sessions were included.)

Adjunct Faculty, *BGC Trust University*, Bangladesh   Jan 2020 - Dec 2020
- As adjunct faculty, I taught several courses including Neural Network and Fuzzy Logic, Pattern Recognition, Operating System, and Harvard University's course CS50.
- Concerned lab sessions were included.

INDUSTRY EXPERIENCE

Web Developer, *Dealer Solutions*, Brisbane, Australia   March 2018 - September 2018
- Worked as a front-end developer together with internal/external cross functional web developers, software developers, team leads, web project coordinator and managers.
- Resolved issues for automotive sites and created modules for WordPress multisite system.

SKILLS

- **Programming Language and Tools:** Python, C/C++, JAVA, MATLAB, Tex (Latex)
- **Tools and Libraries:** TensorFlow, PyTorch, Scikit-learn, Keras, XgBoost, CatBoost, Pandas, Numpy, OpenCV, Matplotlib, Anaconda Environment, Jupyter Notebooks, PyCharm IDE, VSCode
- **Version Control System:** Git.
- **Content Management Systems:** Joomla and WordPress

REFERENCES

- Available on Contact