Mohammad Azam Khan

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST) · RESEARCH SCIENTIST

KAIST NAVER Hypercreative AI Center, 95, Jeongjail-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, South Korea.

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Education

Korea University
Seoul, South Korea

PH.D. IN COMPUTER SCIENCE AND ENGINEERING
Sep. 2016 - Feb. 2020

- Supervisor: Jaegul Choo, Associate Professor, Graduate School of Artificial Intelligence, KAIST
- Thesis: Fault Detection and Classification of Short-Term Time-Series Data via Deep Neural Networks
- CGPA: 4.38/4.50

Bangladesh University of Engineering and Technology (BUET)
Dhaka, Bangladesh

M.ENGG. IN COMPUTER SCIENCE AND ENGINEERING
May 2008 - Sep. 2013

- Supervisor: Khaled Mahmud Shahriar, Assistant Professor, Department of Computer Science and Engineering, BUET.
- Thesis: Development of a phone based accountable customer support service solution for large enterprises using ASTERISK based open source IP-PBX system.
- CGPA: 2.95/4.0

International Islamic University Chittagong (IIUC)
Chittagong, Bangladesh

B.SC.ENGG. IN COMPUTER SCIENCE AND ENGINEERING
Apr. 2004 - Feb. 2008

- CGPA: 3.288/4.0

Skills

Expertise	Machine/Deep Learning, Time Series Data Analytics, Medical Image Analysis
Programming	Python
Framework	PyTorch
Languages	Bengali, English, Korean

Work Experience

Graduate School of Artificial Intelligence, KAIST
Daejeon, South Korea

RESEARCH SCIENTIST
Dec. 2021 - to-date

- Time series data analytics.
- Medical image analysis.

Dhaka Power Distribution Company Limited (DPDC)
Dhaka, Bangladesh

ASSISTANT/SUB-DIVISIONAL/EXECUTIVE ENGINEER
Mar. 2009 - Nov. 2021

- Present and support the IT Head and other top management in preparing IT strategies.
- Direct technological research by studying organization goals, strategies, practices of DPDC.
- Develop and implement necessary steps for the introduction of useful new technologies and ideas in DPDC.
- Meter reading snapshot validation via convolutional neural networks (CNNs).
- Maintains professional and technical knowledge by attending educational workshops, reviewing professional publications, and so on.

Graduate School of Artificial Intelligence, KAIST
Daejeon, South Korea

POST-DOCTORAL RESEARCHER
Mar. 2020 - Aug. 2020

- Development of deep learning models for medical image analysis.

Department of Computer Science and Engineering, BUET
Dhaka, Bangladesh

TEACHING ASSISTANT
Jun. 2008 - Mar. 2009

- Worked under several senior faculty members and helped them perform various academic activities.
- Involved in a number of projects such as an SQL Query Judging System, and an SSO (Single-Sign-On) networking system for both Linux and Windows using LDAP and SAMBA implemented in the Department.

Publications

Journal

- Seong Ji Choi,* **Mohammad Azam Khan**,* Hyuk Soon Choi, Jaegul Choo, Jae Min Lee, and Soonwook Kwon, "Development of Artificial Intelligence System for Quality Control of Photo Documentation in Esophagogastroduodenoscopy," Surgical Endoscopy, 2021. (*: equal contributions)
- **Mohammad Azam Khan**,* Soonwook Kwon,* Jaegul Choo, Seok Min Hong, Sung Hun Kang, Il-Ho Park, Sung Kyun Kim, and Seok Jin Hong, "Automatic detection of tympanic membrane and middle ear infection from oto-endoscopic images via convolutional neural networks," Neural Networks 126 (2020) 384-394. (*: equal contributions)
- **Mohammad Azam Khan**, Jaegul Choo, and Yong-Hwa Kim, "Intelligent fault detection using raw vibration signals via dilated convolutional neural networks," Journal of Supercomputing (2018). doi: 10.1007/s11227-018-2711-0
- **Mohammad Azam Khan**, Yong-Hwa Kim and Jaegul Choo, "End-to-End Partial Discharge Detection in Power Cables via Time-Domain Convolutional Neural Networks," Journal of Electrical Engineering and Technology (2019), 14, 1299-1309.
- Sharib Ali, Felix Zhou, Barbara Braden, Adam Bailey, Suhui Yang, Guanju Cheng, Pengyi Zhang, Xiaoqiong Li, Maxime Kayser, Roger D. Soberanis-Mukul, Shadi Albarqouni, Xiaokang Wang, Chunqing Wang, Seiryo Watanabe, Ilkay Oksuz, Qingtian Ning, Shufan Yang, **Mohammad Azam Khan**, Xiaohong W. Gao, Stefano Realdon, Maxim Loshchenov, Julia A. Schnabel, James E. East, Georges Wagnieres, Victor B. Loschenov, Enrico Grisan, Christian Daul, Walter Blondel and Jens Rittscher, "An objective comparison of detection and segmentation algorithms for artefacts in clinical endoscopy," Scientific Reports (2020), 10 (1), 1-15.
- N. Kumar et al., "A Multi-Organ Nucleus Segmentation Challenge," in IEEE Transactions on Medical Imaging, vol. 39, no. 5, pp. 1380-1391, May 2020, doi: 10.1109/TMI.2019.2947628.

Conference

- Youngin Cho,* Daejin Kim,* Dongmin Kim, **Mohammad Azam Khan**, and Jaegul Choo, "WaveBound: Dynamic Error Bounds for Stable Time-Series Forecasting," Conference on Neural Information Processing Systems (**NeurIPS**), 2022.
- Youngin Cho,* Daejin Kim,* **Mohammad Azam Khan**, and Jaegul Choo, "Mining Multi-Label Samples from Single Positive Labels," Conference on Neural Information Processing Systems (**NeurIPS**), 2022.
- Youngin Cho, Junsoo Lee, Soyoung Yang, Juntae Kim, Yeojeong Park, Haneol Lee, **Mohammad Azam Khan**, Daesik Kim, and Jaegul Choo, "Guiding Users to Where to Give Color Hints for Efficient Interactive Sketch Colorization via Unsupervised Region Prioritization," Winter Conference on Applications of Computer Vision (**WACV**), 2023.
- Deepak Chandra Roy, Md Shazzad Hossain, Amit Kumar Das, Md. Ashraf Ali and **Mohammad Azam Khan**, "Towards Reliable Power Supply: An Approach to Low-cost IoT-based Power Interruption Monitoring System," International Conference on Big Data, IoT and Machine Learning (BIM 2021).
- Sultan Uddin Khan, Md Shazzad Hossain and **Mohammad Azam Khan**, "Green Energy from Cycle Rickshaws: A Novel Approach to Utilize the Impoverished Section of Bangladesh," International Conference on Green Energy, Computing and Sustainable Technology (GECOST), 2021.
- Daejin Kim, **Mohammad Azam Khan**, and Jaegul Choo, "Not just Compete, but Collaborate: Local Image-to-Image Translation via Cooperative Mask Prediction," IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2021.
- Cheonbok Park,* Yunwon Tae,* TaeHee Kim, Soyoung Yang, **Mohammad Azam Khan**, Lucy Park, and Jaegul Choo, "Unsupervised Neural Machine Translation for Low-Resource Domains via Meta-Learning," Joint Conference of the Annual Meeting of the Association for Computational Linguistics and the International Joint Conference on Natural Language Processing (**ACL-IJCNLP**), 2021.
- **Mohammad Azam Khan** and Khaled Mahmud Shahriar, "ASTERISK Based Open Source IP-PBX System for Accountable Customer Support Service," 3rd International Symposium on Computational and Business Intelligence, Bali, Indonesia, 2015. https://ieeexplore.ieee.org/document/7383542

Workshop

- Seong Ji Choi,* **Mohammad Azam Khan**,* Jin Hwa Park, Jae Hoon Yoon, Hong Sik Lee, Hoon Jai Chun, Jaegul Choo, Hyuk Soon Choi, "Development of a Video-Based Artificial Intelligence System for Enhanced Quality Control in Esophagogastroduodenoscopy," the 7th Korea Digestive and Disease Week 2023, Gut and Liver (KD, Volume 17 • Number 6 (Suppl. 1) November 2023. (*: equal contributions)
- S.A. Yoo*, **M.A. Khan***, J.H. Kim, J.Y. Hwa, S.M. Oh, J. Choo, K.H. Yang, J.T. Ahn, J.H. Lee, "Attention-based Mechanism for Acne Image Grading via Convolutional Neural Networks," Maui Derm Hawaii 2024 (Accepted) January 22-26, 2024. (*: equal contributions)
- **Mohammad Azam Khan** and Jaegul Choo, "Classification of cancer microscopic images via convolutional neural networks. In Lecture Notes in Bioengineering (pp. 141-147), 2019. doi: 10.1007/978-981-15-0798-4_15
- **Mohammad Azam Khan**, Yong-Hwa Kim and Jaegul Choo, "Intelligent fault detection via dilated convolutional neural networks," IEEE International Conference on Big Data and Smart Computing, Computer Society (2018), pp. 729-731.
- **Mohammad Azam Khan** and Jaegul Choo., "Multi-class artefact detection in video endoscopy via convolution neural networks," In Proceedings of the 2019 Challenge on Endoscopy Artefacts Detection (EAD2019), Venice, Italy, 8th April, volume 2366 of CEUR Workshop Proceedings. CEUR-WS.org, 2019.
- Seokwoo Jung, Sungha Choi, **Mohammad Azam Khan** and Jaegul Choo, "Towards Lightweight Lane Detection by Optimizing Spatial Embedding," Workshop on Perception for Autonomous Driving (ECCV 2020), arXiv: 2008.08311.

Selected Competitions

Brain Tumor Segmentation (Advisor)
11/2021

HeLP Challenge 2021, Asan Medical Center, Seoul, South Korea

- Position: 1st place.
- Competition site: Internal (Private connection through VPN only)

Brain Tumor Segmentation
3/2019

HeLP Challenge 2018, Asan Medical Center, Seoul, South Korea

- Position: 2nd place among 11 teams.
- Competition site: https://www.synapse.org/#!Synapse:syn15569329/wiki/582412

Multi-class artefact detection in video endoscopy
3/2019

Artefact detection Challenge (EAD 2019), ISBI 2019

- Position: 10th place among 29 actively participated teams.
- Competition site: https://ead2019.grand-challenge.org/

Classification of leukemic B-lymphoblast cells from normal B-lymphoid precursors from blood smear microscopic images
3/2019

Classification of Normal vs Malignant Cells in B-ALL White Blood Cancer Microscopic Images, ISBI 2019

- Position: 12th place among 25 teams allowed for final round.
- Competition site: https://competitions.codalab.org/competitions/20395

RSNA Pneumonia Detection Challenge
10/2018

Kaggle

- Position: 62/1499 (Top 5%)
- Competition site: https://www.kaggle.com/c/rsna-pneumonia-detection-challenge

Mercedes-Benz Greener Manufacturing
7/2017

Kaggle

- Position: 73/3835 (Top 2%)
- Competition site: https://www.kaggle.com/c/mercedes-benz-greener-manufacturing

Intel & MobileODT Cervical Cancer Screening
6/2017

Kaggle

- Position: 38/848 (Top 5%)
- Competition site: https://www.kaggle.com/c/intel-mobileodt-cervical-cancer-screening

Research Community Service

Conference Reviewing (Partial)

2021-23	Neural Information Processing Systems (NeurIPS)
2022-24	International Conference on Learning Representations (ICLR)
2022-24	International Conference on Machine Learning (ICML)
2019-20	IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
2018-20	Asian Conference on Machine Learning (ACML)
2018-19	Medical Image Computing and Computer Assisted Interventions (MICCAI)
2018	IEEE International Conference on Big Data and Smart Computing

Journal Reviewing (Partial)

2021	Journal of Computers and Information Technology
2020	Artificial Intelligence In Medicine
2020	Scientific Reports
2019	The Journal of Supercomputing
2018-19	IEEE Transactions on Visualization and Computer Graphics (TVCG)
2018-19	ACM Transactions on Interactive Intelligent Systems (TiiS)

Travel Grants

ARTEFACT DETECTION CHALLENGE (EAD 2019), ISBI 2019   *Venice, Italy*

PRESENTER FOR MULTI-CLASS ARTEFACT DETECTION IN VIDEO ENDOSCOPY   *Mar. 2019*

- Supported by: University of Oxford and MedIAN (https://www.median.ac.uk/)
- Featured interview: `https://www.median.ac.uk/blog/conversation-travel-grant-recipient-mohammad-azam-khan-\ieee-isbi-ead2019-challenge`

Honors & Awards

INTERNATIONAL

2007   **18th Place**, The ACM Asia Programming Contest (ICPC Dhaka site)   *Dhaka, Bangladesh*

DOMESTIC

2021   **Champion - Research and Development**, National ICT Awards 2020   *Dhaka, Bangladesh*

2021   **Winner - Technology (Artificial Intelligence)**, National ICT Awards 2020   *Dhaka, Bangladesh*

2018   **2nd Place (Awarded KRW 1,000,000)**, HeLP Challenge 2018 (Ch1: Brain Tumor Segmentation)   *Seoul, South Korea*

2015   **9th place**, Daffodil Japan IT Online Quiz Contest   *Dhaka, Bangladesh*

2009   **Nationwide one of the ten top scorers (Awarded BDT 100,000)**, ACI Pure Salt Deshke Jano Quiz Contest   *Bangladesh*

Extracurricular Activity

General Secretary   *Chittagong, Bangladesh*

COMPUTER CLUB AT IIUC   *Mar. 2007 - Feb. 2008*

- Successfully planned, organized and executed major events - programming contest, software contest, quiz contest, open source campaign, math olympiad, seminar, workshop, IT debate, and IT festival etc.
- Conducted workshops on ACM programming contest and taught junior students to increase problem-solving capabilities by developing examples and answering questions.
- Led executive meetings and planned the strategic development and goals of the club.

Invited Talks

Department of Computer Science and Engineering, IIUC   *Chittagong, Bangladesh*

PRESENTER FOR INTRODUCING RECENT TRENDS OF COMPUTER SCIENCE   *Feb. 2017*

- Recent trends in Computer Science and Engineering.
- Introduced big data analytics, deep learning, IoT.

References

- Provided upon request.