A. K. M. Azad, Ph.D.

azad_du28@yahoo.com Nationality: Australian
https://scholar.google.com.au/citations?user=p-Rne_wAAAAJ
https://linkedin.com/in/a-k-m-azad-6039931a/
https://github.com/Akmazad

Personal Statement

- A passionate, motivated, and committed academician/data analyst with over 10 years of solid research career in **AI**, **Machine learning** & **Deep learning-empowered Bio-medicine**. Led, supervised and collaborated many successful research projects with competitive grants yielding high impact research outputs. Over 6 years of Lecturing/Tutoring/Mentoring experience in Top-ranked Australian universities including **UNSW**, **Monash**, **UTS**, **Swinburne**, and **RMIT**. Looking forward to lead/join/contribute to **AI-driven** researches in reputed institutions or universities.

Research Interest

- *AI/ML/DL-enhanced Big-Biodata analyses, Bioinformatics, Computational Biology, Machine learning, Deep learning, Data Science, Bayesian Methods, Bayesian Network, Host-Pathogen interaction, Multi-omics integration, Next generation Sequencing data, Modelling and statistical analyses of Biological network, Bio-data Mining, bio-marker discovery, etc.*

Education

2013 – 2017 — **Ph.D.** from **School of Mathematical Sciences, Monash University, Australia [Ranked #58 in QS Top Universities]** in *Major: Biostatistics, Bioinformatics, Computational Biology & AI*.
Thesis title: *Computational modelling and characterisation of cell signaling cross-talks in acquired drug resistance.* [Reviewers: Prof. Michael Stumpf (**Imperial College London, UK**) and Prof. Edmund Crampin (**University of Melbourne, AU**)]

2010 – 2012 — **M.Sc.** from **Dept. of Information & Communications, GIST, South Korea [Ranked #5 in QS Top Universities - citation per faculty]** in *Bioinformatics* (Major), *Computational Biology* and *AI* (Minor).
Thesis title: *Network Reconstruction Approach for Integrating Gene Expression and Copy Number Aberration Reveals Cancer Related Pathways.*

2003 – 2008 — **B.Sc. (Hons)** from **Dept. of Computer Science & Engineering, University of Dhaka, Bangladesh.** in Computer Science & Engineering (Major)
Final year thesis (*Bioinformatics* Major) title: *Plant Promoter Prediction: A machine learning approach.*

Employment History

2020 – 2021 — **Research Fellow** *in AI/ML/Bioinformatics/Phylogenetics*, iThree Institute, University of Technology Sydney, Australia

2018 – 2020 — **Post-doctoral Research Associate** *in AI/ML/DL/Bioinformatics*, School of BABS, UNSW Sydney, Australia

2019 – 2020 — **Bioinformatician**, Bill Walsh Lab, Kolling Institute of Medical Research, University of Sydney, Australia

2019 – ongoing — **Lecturer**, Faculty of Science & Technology, Swinburne University of Technology Sydney, Australia

Employment History (continued)

2019 – 2019 **Online Facilitator**, RMIT, Australia

2017 – 2018 **Post-doctoral Research Fellow** *in AI/NLG*, Monash University, Clayton, Australia

2014 – 2018 **Teaching Associate**, Monash University, Clayton, Australia

2013 – 2017 **PhD Researcher** *in Biostatistics/Computational Biology*, Monash University, Clayton, Australia

2010 – 2013 **Researcher** & **Research Assistant** *in Bioinformatics/Computational Biology*, Gwangju Institute of Science & Technology, Gwangju, South Korea

2009 – 2010 **Software Architect**, BDCOM, Dhaka, Bangladesh

2009 – 2009 **Senior .NET Programmer**, QusarBD, Dhaka, Bangladesh

2008 – 2009 **Visual Studio .NET Programmer**, SGCsoft.NET Pvt. Ltd., Dhaka, Bangladesh

Research Grants

- **Bayesian methods in causal model-based cancer bio-marker discovery**, *Deanship of Scientific Research, Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia, Grant No. (19-12-12-024).* **[Completed]**
- **Multi-modal similarity-based in silico combination-therapy prioritization for COVID-19 drugs**, *Deanship of Scientific Research, Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia, Grant No. (21-13-18-008)* **[Completed]**.
- **Stem cell therapies and benefaction of somatic cell nuclear transfer cloning in COVID-19 Era**, *Deanship of Scientific Research, Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia, Grant No. (21-13-18-029)* **[Completed]**.
- **Improving Health Outcome of People with Cardiovascular Diseases using Artificial Intelligence and Digital Health Technologies**, *Deanship of Scientific Research, Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia.* **[Granted]**

Research Publications

Full papers - by year

1. Nashiry, M. A., Sumi, S. S., Sharif Shohan, M. U., Alyami, S. A., **Azad, A. K. M.**, & Moni, M. A. (2021, May). Bioinformatics and system biology approaches to identify the diseasome and comorbidities complexities of SARS-CoV-2 infection with the digestive tract disorders. ***Briefings in Bioinformatics*** *- [**Q1; IF: 8.99; Rank: 2/59 in Mathematical and Computational Biology**]*. bbab126. https://doi.org/10.1093/bib/bbab126

2. **Azad, AKM** & Alyami, S. A. (2021, April). Discovering novel cancer bio-markers in acquired lapatinib resistance using bayesian methods. ***Briefings in Bioinformatics*** *- [**Q1; IF: 8.99; Rank: 2/59 in Mathematical and Computational Biology, citation: 1**]*. bbab137. https://doi.org/10.1093/bib/bbab137

3. Ahamad, M. M., Aktar, S., Uddin, M. J., Rashed-Al-Mahfuz, M., **Azad, AKM**, Uddin, S., … Moni, M. A. (2021). Adverse effects of covid-19 vaccination: machine learning and statistical approach to identify and classify incidences of morbidity and post-vaccination reactogenicity. ***medRxiv***. doi:10.1101/2021.04.16.21255618

4. Aktar, S., Ahamad, M., Rashed-Al-Mahfuz, M., **Azad, AKM**, Uddin, S., Kamal, A., … Moni, M. A. (2021). Machine learning approach to predicting covid-19 disease severity based on clinical blood test data: statistical analysis and model development. ***JMIR Medical Informatics*** *[**IF: 2.58; citation: 6**]*, *9*(4). https://doi.org/10.2196/25884

5. Akter, T., Khan, M. I., Satu, M. S., Ali, M. H., Uddin, M. J., **Azad, AKM**, … Moni, M. A. (2021). Improved transfer learning-based face recognition model to detect autistic children at an early stage. ***Brain Sciences*** - *[**Q2; IF: 3.31**], 11*(6). doi:10.3390/brainsci11060734

6. **Azad, A. K. M.**, Fatima, S., & Vafaee, F. (2021). Integrative resource for network-based investigation of covid-19 combinatoric drug repositioning and mechanism of action. ***Patterns*** - *Cell Press - Under Revision.*

7. CHAKRABORTY, P., AHMED, S., YOUSUF, M. A., **AZAD, AKM**, ALYAMI, S. A., & MONI, M. A. (2021). A human-robot interaction system calculating visual focus of human's attention level. ***IEEE Access*** - *Revision Submitted.*

8. Chowdhury, U. N., Faruqe, M. O., Mehedy, M., Ahmad, S., Islam, M. B., **Azad, AKM**, & Moni, M. A. (2021). Effects of bacille calmette guerin (bcg) vaccination during covid-19 infection. ***Genomics*** - *Submitted.*

9. Islam, M. K., Islam, M. R., Islam, M. Z., Rahman, M. H., Mamun, M. M. I., **Azad, AKM**, & Moni, M. A. (2021). Network based systems biology approach to identify diseasome and comorbidity associations of systemic sclerosis with cancers. ***Journal of Personalized Medicine*** - *Submitted.*

10. KHATUN, M. A., YOUSUF, M. A., AHMED, S., UDDIN, M. Z., **AZAD, AKM**, ALYAMI, S. A., & MONI, M. A. (2021). Lstm-attention model for walking pattern recognition. ***IEEE Access*** - *Submitted.*

11. Moni, M. A., Islam, M. R., Islam, M. M., Rashed-Al-Mahfuz, M., Islam, M. S., **Azad, AKM**, … Lio', P. (2021). A review on emotion recognition from eeg signal focusing deep learning and shallow learning techniques. ***IEEE Access*** - *Revision submitted.*

12. Rashed-Al-Mahfuz, M., Haque, A., **Azad, AKM**, Alyami, S. A., Quinn, J. M., & Moni, M. A. (2021). Clinically applicable machine learning approaches to identify attributes of chronic kidney disease (ckd) for use in low-cost diagnostic screening. ***IEEE Journal of Translational Engineering in Health Medicine*** - *[**Q2**; IF: 2.53], 9*, 1–11. doi:10.1109/JTEHM.2021.3073629

13. Satu, M. S., Ahammed, K., Abedin, M. Z., Rahaman, M. A., Islam, S. M. S., **Azad, AKM**, & Moni, M. A. (2021). Convolutional neural network model to detect covid-19 patients utilizing chest x-ray images. ***Machine Learning with Applications*** - *Submitted.*

14. **Azad, A K M**, Dinarvand, M., Nematollahi, A., Swift, J., Lutze-Mann, L., & Vafaee, F. (2020, June). A comprehensive integrated drug similarity resource for in-silico drug repositioning and beyond. ***Briefings in Bioinformatics*** - *[**Q1; IF: 8.99; Rank: 2/59 in Mathematical and Computational Biology, citation: 2**]*. bbaa126. https://doi.org/10.1093/bib/bbaa126

15. Nicholson, A. E., Korb, K. B., Nyberg, E. P., Nyberg, Wybrow, M., **Azad, AKM**, Zukerman, I., … Lagnado, D. (2020). Bard: a structured technique for group elicitation of bayesian networks to support analytic reasoning. ***arXiv*** *preprint arXiv:2003.01207*. https://arxiv.org/abs/2003.01207

16. Rashidi, T. H., Shahriari, S., **Azad, A. K. M.**, & Vafaee, F. (2020). Real-time time-series modelling for prediction of covid-19 spread and intervention assessment. ***Scientific Reports***, *Nature publishing Group - Revision (Under Revision) [**Q1; IF: 4.25; Rank: 6/120 in Multi-disciplinary Sciences, citation: 1**].*

17. **Azad, A. K. M.** & Vafaee, F. (2019). Single cell data explosion: deep learning to the rescue. ***arXiv*** *preprint arXiv:1901.06105.*

18. **Azad, A. K. M.** (2018a). Kpgminer: a tool for retrieving pathway genes from kegg pathway database. ***bioRxiv***, 416131.

19. **Azad, A. K. M.** (2018b). Xtalkiis: a tool for finding data-driven cross-talks between intra-/inter-species pathways. ***BioRxiv***, 437541.

20. **Azad, A. K. M.**, Alyami, S. A., & Keith, J. M. (2018). Bnmcmc: a software for learning and visualizing bayesian networks using mcmc methods. ***bioRxiv***, 414953.

21. **Azad, A. K. M.**, Lawen, A., & Keith, J. M. (2018). Cross-talk categorisations in data-driven models of signalling networks: a system-level view. In ***Gene Expression and Regulation in Mammalian Cells-Transcription From General Aspects***. InTech [**citation: 1**]. http://dx.doi.org/10.5772/intechopen.72408

22. **Azad, A. K. M.** (2017). Integrating heterogeneous datasets for cancer module identification. In ***Bioinformatics*** (pp. 119–137). Springer.

23. **Azad, A. K. M.**, Lawen, A., & Keith, J. M. (2017). Bayesian model of signal rewiring reveals mechanisms of gene dysregulation in acquired drug resistance in breast cancer. ***PloS one*** *[**Q1; IF: 2.78; citations: 12**]*, *12*(3), e0173331. https://doi.org/10.1371/journal.pone.0173331

24. Alyami, S. A., **Azad, A. K. M.**, & Keith, J. M. (2016a). The neighborhood mcmc sampler for learning bayesian networks. In ***First International Workshop on Pattern Recognition*** (Vol. 10011, 100111K). International Society for Optics and Photonics [**citation: 2**]. http://dx.doi.org/10.1117/12.2242708

25. Alyami, S. A., **Azad, A. K. M.**, & Keith, J. M. (2016b). Uniform sampling of directed and undirected graphs conditional on vertex connectivity. ***Electronic Notes in Discrete Mathematics*** *[**Q3**]*, *53*, 43–55.

26. **Azad, A. K. M.**, Lawen, A., & Keith, J. M. (2015, January). Prediction of signaling cross-talks contributing to acquired drug resistance in breast cancer cells by bayesian statistical modeling. ***BMC Systems Biology*** *[**Q1; IF: 2.05; citations: 20**]*, *9*(1), 2. doi:10.1186/s12918-014-0135-x

27. **Azad, A. K. M.** & Lee, H. (2013). Voting-based cancer module identification by combining topological and data-driven properties. ***PloS one*** *[**Q1; IF: 2.78; citations: 8**]*, *8*(8), e70498. https://doi.org/10.1371/journal.pone.0070498

28. **Azad, A. K. M.**, Shahid, S., Noman, N., & Lee, H. (2011). Prediction of plant promoters based on hexamers and random triplet pair analysis. ***Algorithms for Molecular Biology*** *[**Q1; IF: 1.71; citations: 20**]*, *6*(1), 19. https://doi.org/10.1186/1748-7188-6-19

Abstracts

1. **Azad, A. K. M.**, Lawen, A., & Keith, J. M. (2016). Bayesian approach for modelling condition-specific signal rewiring reveals possible mechanism of gene dys-regulation in acquired resistance in breast cancer cell-lines. ISMB conference, Florida, USA.

2. **Azad, A. K. M.** & Keith, J. M. (2014). Prediction of drug-resistive cross-talks among signaling pathways in breast cancer by bayesian statistical modeling. International Conference on Systems Biology, Melbourne, Australia.

3. **Azad, A. K. M.** & Lee, H. (2011). Network reconstruction approach for integrating gene expression and copy number dataset. GIW conferrence, Busan, South Korea.

Teaching

Courses

- **Object Oriented Programming**, *Postgraduate level*, **6 semesters**, Swinburne University of Technology, Sydney, Australia.
- **Database Management Systems in BigData era**, *Postgraduate level*, **2 semesters**, Swinburne University of Technology, Sydney, Australia.
- **Intelligent systems**, *Postgraduate level*, **2 semesters**, Monash University, Australia.
- **Research methods in computer science** , *Postgraduate and undergraduate level*, **1 semester**, Monash University, Australia.
- **Discrete mathematics for computer science**, *Undergraduate level* **5 semesters**, Monash University, Australia.
- **Introduction to Programming**, *Undergraduate level*, **1 semester**, RMITOnline.

Teaching (continued)

- **Introduction to computer science**, *Undergraduate level*, **1 semester**, Monash University, Australia.
- **Algorithms and programming**, *Undergraduate level*, **1 semester**, Monash University, Australia.
- **Algorithmic problem solving**, *Undergraduate level*, **2 semesters**, Monash University, Australia.
- **Techniques for modelling**, *Undergraduate level* **1 semester**, Monash University, Australia.

Roles and Responsibilities

- Lecturing, mentoring students, researching, developing, and implementing effective course contents and teaching plans.
- Facilitating both face-to-face and online lecturing and lab demonstration for various ICT-related courses both in postgraduate and undergraduate level.
- Managing online discussion boards and forums in *Canvas* and *Moodle* platforms.
- Preparing and moderating exam questions, assignments and projects, marking, processing, and submitting assessment results.
- Engaging one-to-one consultation and supports to slow learning students.
- Participating admin meetings to discuss/evaluate course progresses with peers and mentors.
- Managing attendance and feedback.

Research Supervision and Mentorship

- **Research Associate**, School of BABS, UNSW Sydney, Australia.
  Research: *Deep learning models for Brain-specific disorders*
- **Research Associate**, School of BABS, UNSW Sydney, Australia.
  Research: *Drug Repositioning*
- **Research Associate**, School of BABS, UNSW Sydney, Australia.
  Research: *Biomarker Discovery*
- **Honuors Student**, School of BABS, UNSW Sydney, Australia.
  Research: *Role of Side-effects in Drug Repositioning*
- **Honuors Student**, School of BABS, UNSW Sydney, Australia.
  Research: *Cross-species biomarker discoveries using Dual-RNASeq data*
- **SVRP Student**, School of BABS, UNSW Sydney, Australia.
  Research: *Cell-identity mapping from massive single-cell data using deep learning*
- **SVRP Student**, School of BABS, UNSW Sydney, Australia.
  Research: *Deep learning for multi-omics integration*
- **MS Student**, Monash University, Australia.
  Research: *Discovering novel mechanisms of drug-resistance in malaria using systems biological approach*

Professional Memberships

- **COVID19 Expert, Australian Academy of Science**
- **Peer Reviewer, Briefings in Bioinformatics (BiB), Oxford Academic**
- **Peer Reviewer, PLoS One, Public Library of Science**
- **Peer Reviewer, Artificial Intelligence Review (AIRE)**
- **Peer Reviewer, BMC Bioinformatics**
- **Peer Reviewer, BMC Supplements**
- **Bioinformatics Editor, WebmedCentral, UK**

Presentations and Invited talk

2019 Presented a seminar talk at the **School of Biotechnology & Biomolecular Sciences** (University of New South Wales, Australia) on deep learning based functional effect prediction of brain-specific noncoding variants

2017 Presented a seminar talk at the **Monash Bioinformatics Platform** (Monash University, Clayton, Australia) on computational modelling and characterisations of signalling cross-talks in acquired drug resistance

2014 Presented a poster at the **ICSB 2014** - 15th International Conference on Systems Biology, Melbourne, Australia

2011 Presented a poster at the **GIW 2011** - 22nd international conference on genome informatics, Busan, South Korea

Miscellaneous Experience

Awards

2017 **Post Publication Award (PPA)**, Monash University, Australia.

2013 **Monash IPRS scholarship (MIPRS)**, Monash University, Australia.

Monash Graduate Scholarship (MGS), Monash University, Australia.

Departmental Top-up Scholarship, School of Mathematical Sciences, Monash University, Australia.

Travel grants from Monash University, Australia for presenting research works in domestic and international conferences.

2010 Financial supports scholarship from GIST, South Korea, for MS research students through Research Assistantships, tuition assistance, and monthly stipends.

1998–2003 Bangladesh government scholarships for outstanding results in HSC (higher secondary school), SSC (secondary school certificate), and JSC (junior school certificate) exams..

Media Coverage

2016 **Monash University website**, Covering the success story of our algorithm for causal network inference.

2015 **Editors' pick - BMC Systems Biology Journal website**, Covering our work of drug-resistive cross-talk prediction in breast cancer.

Specialization and Certification

2019 **Big data specialization - Part 1**. Awarded by University of California San Diago, Coursera.

2014 **Sessional Staff training**. Awarded by the Faculty of IT, Monash University.

Project Showcase

DrugSimDB; URL: `http://vafaeelab.com/drugSimDB.html`; role: Method development, Data Mining, wrangling & analyses, Visualization, and UI development, deployment, and maintenance

COVID-19 Combination Therapy; URL: `http://vafaeelab.com/COVID19_repositioning.html`; role: Method development, Data Mining, wrangling & analyses, Visualization, and UI development

COVID-19 TS; URL: `http://vafaeelab.com/COVID19TS.html`; role: UI development, deployment, and maintenance

Project Showcase (continued)

- **Pathway Gene Miner**; URL: http://vafaeelab.com/pgminer.html; role: UI development, deployment, and Maintenance
- **Vafaee Lab website**; URL: http://vafaeelab.com/; role: Development, Deployment and Maintenance

Skills

Coding	R | Python | C#.Net | Java/J2EE | MATLAB | Shell Scripting.
High-performance computing	Google Cloud Platform (GCP) | Raijin/Gadi @NCI | Katana @UNSW | HPCC @UTS.
Big Data skills	Parallel programming for Multi-Node Multi-GPU | Deep learning with Pytorch & Keras | Split-and-merge | Nextflow.
Database skills	MongoDB | SQL Server | NoSQL | XQuery | JSON | Xampp | Oracle | MySQL | MS Access | ADO.Net | ODBC | OLE DB | SQLite
Web Dev	R Shiny App | ASP.Net MVC | REST | Web APIs | HTML5 | CSS3 | JavaScript | Jquery | Bootstrap.js | datatable | vis.js | D3.js | Ajax | XML | JSON | Xampp.
R&D technologies	Artificial Intelligence | Data Science | Machine Learning | Deep Learning | Natural Language Generation | Computational Biology | Bioinformatics | Computational cancer genomics | NGS | Data integration | Bayesian statistical modelling | Bayesian Methods | MCMC sampling | Bayesian Network | STAN | JAGS | AgenaRisk APIs | Nextflow.
Optimization methods	Markov Chain Monte Carlo (MCMC) | Variational Inference | WINBUGS | STAN
IDEs	VSCODE | MS Visual Studio | Eclipse | Xamarin | IntelliJ Idea | Xcode | RStudio | PyCharm.
source control	Git | GitHub | Bitbucket.
Development platforms	Windows | Linux | OSX | iOS.
Misc.	Academic research, teaching, training, consultation, LaTeX typesetting and publishing.

References

Fatemeh Vafaee, PhD
Senior Lecturer, School of BABS,
UNSW, Sydney, Australia.
f.vafaee@unsw.edu.au

Viive Howell, PhD
Laboratory Research Director
Bill Walsh Translational Cancer Research Laboratory
Medicine, Northern Clinical School
Kolling Institute of Medical Research
viive.howell@sydney.edu.au

Alfons Lawen, PhD
Adjunct Senior Lecturer, School of Biochemistry & Molecular Biology,
Monash University, Clayton, Autralia.
alfons.lawen@monash.edu