

RAKTIM MONDOL

Sydney, NSW, Australia ♦ Authorised to work

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SUMMARY

Experienced Data Scientist and AI researcher with a PhD in Computer Science, specializing in artificial intelligence (AI), generative AI (GenAI) techniques, large language models (LLMs), computer vision, bioinformatics, and high-performance computing. Research and professional background includes analyzing large-scale biomedical datasets, developing novel deep learning models, and applying explainable AI frameworks for multi-modal data fusion to advance clinical prediction. Strong expertise in programming (Python, R, MATLAB), statistical modeling, algorithm design, and data-driven discovery. Dedicated, collaborative, and results-oriented professional with a track record of delivering impactful AI solutions and advancing cutting-edge applications of AI.

EDUCATION

PhD in Computer Science and Engineering University of New South Wales (UNSW), Sydney, Australia	2021 - 2025 (August)
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Masters by Research, Computer Science & Bioinformatics RMIT University, Melbourne, Australia	2017 - 2019
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Bachelor of Science, Electrical and Electronic Engineering BRAC University, Dhaka, Bangladesh <i>Concentration: Electronics, Computer Science</i>	2009 - 2014
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SKILLS

Programming:	Python, R, SQL, L ^A T _E X
Libraries:	PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, Matplotlib, Seaborn, OpenCV
NLP/LLM:	SpaCy, NLTK, LangChain, Retrieval-Augmented Generation (RAG)
IDE:	VS Code, RStudio, Jupyter Notebook
Cloud Platforms:	Basic familiarity with AWS, GCP, Azure
Data Science & ML:	Deep Learning (CNNs, Autoencoders, Transformers), Supervised & Unsupervised Learning, Feature Engineering, Model Validation, Explainable AI (XAI)
Data Analysis:	Statistical Modelling, Hypothesis Testing, Data Visualization, Large-scale Data Processing
Version Control:	Git, GitHub
Soft Skills:	Collaboration, Communication, Analytical Thinking, Problem Solving

EXPERIENCE

UNSW Sydney <i>Casual Academic (Teaching Assistant)</i>	Jul 2021 – Present <i>Sydney, NSW</i>
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- Communicated complex technical concepts in AI, Deep Learning, and Computer Vision to undergraduate students.
- Facilitated lab sessions, providing hands-on guidance with programming (Python) and ML frameworks.

UNSW Sydney
Doctoral Researcher

Mar 2021 – Jan 2025
Sydney, NSW

- Developed and implemented novel deep learning models (Python, TensorFlow/PyTorch) for complex prediction tasks (e.g., cancer prognosis, gene expression prediction) using large-scale, multimodal datasets (histopathology images, TCGA genomics).
- Applied advanced statistical analysis and machine learning techniques for survival risk stratification and biomarker discovery.
- Engineered feature extraction pipelines and data fusion methodologies to integrate diverse data sources effectively.
- Investigated and implemented Explainable AI (XAI) techniques (e.g., graph-based methods) to interpret model predictions, contributing to responsible AI development.
- Collaborated closely with domain experts (pathologists, biologists) to define research problems and validate findings.
- Authored and co-authored multiple publications in peer-reviewed journals and international conferences.

RMIT University
Teaching Assistant (Casual)

Jul 2017 – Oct 2019
Melbourne, VIC

- Conducted laboratory classes for Electronics, Software Engineering Design, Engineering Computing I, Introduction to Embedded Systems.

RMIT University
Master's Researcher

Mar 2017 – Apr 2019
Melbourne, VIC

- Designed and trained an Adversarial Autoencoder (Python, TensorFlow) to classify cancer subtypes from high-dimensional gene expression data.
- Developed bioinformatics pipelines for identifying relevant genes and potential novel mutations, demonstrating proficiency in handling structured biological data.

World University of Bangladesh
Lecturer (Full-Time)

Sep 2013 – Dec 2016
Dhaka, Bangladesh

- Delivered lectures and laboratory sessions for core EEE courses (Circuits, Electronics, Digital Logic, DSP, Microprocessors).
- Supervised undergraduate student projects and theses.

PROJECTS

- **Explainable AI for Histopathology Analysis (GRAPHITE):** Built a novel graph-based deep learning framework to enhance model interpretability in breast cancer image analysis, aiding pathologist trust and understanding. Focused on XAI methods. (Submitted 2024).
- **Multimodal Data Fusion for Cancer Survival Prediction (BioFusionNet/MM-SurvNet):** Developed deep learning models integrating histopathology images and genomic data (TCGA) to improve breast cancer survival risk stratification. Utilized Python, PyTorch, and advanced statistical survival analysis techniques. (Published IEEE JBHI 2024, ISBI 2024).
- **Cross-Domain Gene Expression Prediction (hist2RNA):** Created an efficient DL architecture (Python, TensorFlow) to predict gene expression directly from histopathology images, bridging imaging and genomics domains. (Published Cancers 2023).
- **Adversarial Learning for Biomarker Discovery (AFExNet):** Designed an Adversarial Autoencoder to differentiate cancer subtypes and extract biologically relevant genes from high-throughput genomic data. (Published IEEE/ACM TCBB 2021).

- **Hardware Acceleration for ML Models (FPGA):** Designed and implemented hardware architectures on FPGAs for regression models (anemia detection, chlorophyll estimation) and face recognition systems, demonstrating understanding of efficient computation. (Published ICIEV 2014, SKIMA 2014, ICIECS 2015).

PUBLICATIONS

Journal Papers

- Mondol R.K., Millar E.K.A., Graham P.H., Browne L., Sowmya A., Meijering E. "GRAPHITE: Graph-Based Interpretable Tissue Examination..." (Submitted, Under Review), 2024. [\[arXiv\]](#)
- Mondol R.K., Millar E.K.A., Sowmya A., Meijering E. "BioFusionNet: Deep Learning-Based Survival Risk Stratification..." *IEEE J. Biomed. Health Inform.*, 2024. [\[IEEE Xplore\]](#)
- Mondol R.K., Millar E.K.A., Graham P.H., Browne L., Sowmya A., Meijering E. "hist2RNA: An Efficient Deep Learning Architecture..." *Cancers*, 2023. [\[MDPI\]](#)
- Mondol R.K., Truong N.D., Reza M., Ippolito S., Ebrahimie E., Kavehei O. "AFExNet: An Adversarial Autoencoder..." *IEEE/ACM Trans. Comput. Biol. Bioinform.*, 2021. [\[IEEE Xplore\]](#)

Conference Proceedings

- Mondol R.K., Millar E.K.A., Sowmya A., Meijering E. "MM-Survnet: Deep Learning-Based Survival Risk Stratification..." *IEEE ISBI*, Athens, Greece, 2024. [\[IEEE Xplore\]](#)
- Khan M.I., Mondol R.K., Zamee M.A., Tarique T.A. "Hardware architecture design of anemia detecting regression model based on FPGA," *ICIEV*, 2014. [\[IEEE Xplore\]](#)
- Khan I., Mondol R.K. "FPGA based leaf chlorophyll estimating regression model," *SKIMA*, 2014. [\[IEEE Xplore\]](#)
- Mondol R.K., Khan I., Mahbulul Hye Md. A.K., Hassan A. "Hardware architecture design of face recognition system based on FPGA," *ICIECS*, 2015. [\[IEEE Xplore\]](#)
- Hassan A., Mondol R.K., Hasan M.R. "Computer network design of a company — A simplistic way," *ICACCS*, 2015. [\[IEEE Xplore\]](#)

HONORS & AWARDS

- UNSW PhD Scholarship (Tuition Fee and Stipend), 2021-2025
- Masters by Research completed with High Distinction, RMIT University, 2019
- RMIT Research Stipend Scholarship & International Tuition Fee Scholarship, 2017
- Multiple Academic Excellence Awards (Vice Chancellor/Dean), BRAC University, 2010-2013

PROFESSIONAL DEVELOPMENT

- Trained in NGS RNA Seq. & DNA Seq. Data Analysis (ArrayGen), 2019
- Presented Poster at AMSI BioinfoSummer (Monash University), 2017
- Presented Thesis in 3 Minute Thesis (3MT) Competition (RMIT University), 2017
- Trained in High Performance Computing (HPC) (Monash University), 2017