K.M. Tahsin Hassan Rahit, Ph.D.
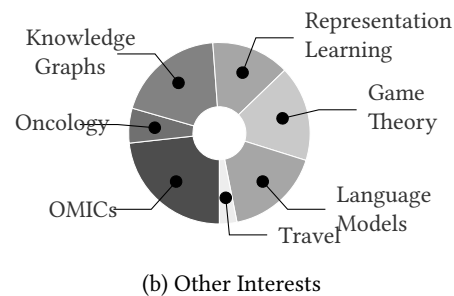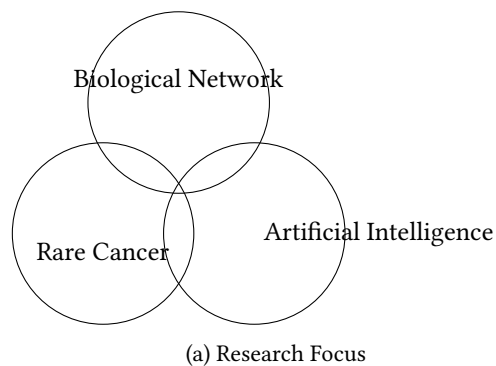
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GitHub: https://github.com/rahit

Highlights

① → A researcher and educator in computational oncology (previously, rare disease) specialized with "low-resource" problems. Interested in Rare Cancer.

② → Passionate about integrating and interpreting biological data modalities with the magic of AI (esp. Graph Networks) that would take years for humans.

③ → Formerly - Lecturer, Project Manager, Software Engineer.

Interests

(a) Research Focus

(b) Other Interests

Education

Sept 2018 - Aug 2024
Fulltime

PHD in Biochemistry & Molecular Biology (Bioinformatics), University of Calgary

Research Area: Machine learning & Artificial Intelligence for Rare disease genomics

Tech Stack: Graph Neural Network (GNN), Natural Language Processing (NLP), Classification models (DT, RF, Logit Reg.) SnakeMake, HPC (SLURM), Python [PyTorch, Dask, Kedro, Pandas, Numpy, Scikit-learn Matplotlib], PowerBI, R, NVivo, Docker, Singularity

- Design and develop innovative ML models and workflows based on genome data.
- Ability to foresee potential roadblocks, devising proactive strategies to mitigate issues and ensuring timely and goal-oriented progression of my projects.
- Demonstrated ability to solve complicated problem with innovative solution.

Jan 2016 - Feb 2017
Fulltime

MSc in Intelligent System, American International University -Bangladesh

Grade: 3.90 on scale 4.00

Research Area: Natural Language Processing (NLP)

Tech Stack: Python [Tensorflow, Keras, Pandas, Numpy, Scikit-learn Matplotlib], Protege

- Contributed in developing WordNet for Bengali language.
- Machine learning ability to learn low-resource language.

Jan 2012 - Feb 2016
Fulltime

BSc in Computer Science & Engineering, American International University -Bangladesh

Research Area: Natural Language Processing (NLP)

Tech Stack: Python [Python, Scrapy, Django], Elasticsearch

- Scrape product reviews from different public websites.
- Sentiment analysis based on collected reviews.

Grade: 3.83 on scale 4.00

Jun 2009 - Aug 2011

HIGH SCHOOL(GRADE 12 PUBLIC EXAM): Notre Dame College, Dhaka

Grade: 4.60 on scale 5.00

Jan 1999 - May 2009

SCHOOL (GRADE 10 PUBLIC EXAM): in B.A.F Shaheen College, Dhaka

Grade: 5.00 on scale 5.00

Experiences

Oct 2024-now
Fulltime

Postdoctoral Associate
Bose Lab, Department of Oncology, Cumming School of Medicine, University of Calgary, Calgary
Skills: GNN, CNN, WGS, Spatial transcriptomics, scRNAseq, ATACSeq, histopathology slides data, Radiology data, EHR.
- My project is focused on using AI methods to integrate multiomics data collected from cancer patients.
- I am also involved with several collaborative projects (i.e. POET) and oversee the data warehousing and maintainance for the lab.

May-Jun '25
Contract

Sessional Instructor
AI Application in Precision Health (MDPR 613), Precision Health Program, Cumming School of Medicine, University of Calgary, Calgary
Skills: Lead and manage Post-graduate level course
- The students were from diverse professional and educational background and many of them were mature students. I successfully designed and ran the course to ensuring maximum learning for all students.

Sept-Dec '24
Contract

Sessional Instructor
AI Application in Health (MDSC 523), Bachelor of Health Science, Cumming School of Medicine, University of Calgary, Calgary
Skills: Lead and manage a 3 credit course.
- Starting for proposing a modernized, updated curriculum, I designed, delivered contents and graded the students based on multiple assessment methods. I also managed two TAs for the course.

Jan-Apr '25
Jan-Apr '24
Jan-Apr '23
Jan-Apr '22
Contract

Teaching Assistant
OMICs Application (MDPR 610), Precision Health Program, Cumming School of Medicine, University of Calgary, Calgary
Skills: Curriculum organization, material development, taking class, managing grades
- The course had three instructors where I helped in teaching, managing course content, communication, grading, creating quiz question.
- Applied different teaching strategies as the students were mature and from diverse backgrounds.

Jan-Jun '19
Casual
20hrs/week

Machine Learning Developer, Stork [AI-based research publication exploration @storkapp.me]
Tech Stack: Python [Spacy, Pandas, Numpy, Matplotlib]
- NLP based projects.
- Utilized textual big data to train, detect and extract specific information.
- Demonstrated ability to build industry level ML model.

Feb 2018 - Jan 2019
Fulltime

Scientific Officer,
Bangladesh Atomic Energy Commission (Govt.), Atomic Energy Research Establishment, Dhaka [Oldest & leading government research organization in Bangladesh @baec.gov.bd]
Tech Stack: SQL, C#, .Net Framework, PowerBI
- Tenure tracked scientist at Institute of Computer Science (ICS)
- Design and develop software based R&D in the organization.

Sept 2017 - Jan 2018
Fulltime

Lecturer, Primeasia University [Renowned university in Bangladesh @primeasia.edu.bd]
Skills: Curriculum development, lecture delivery, student assessment.
Courses taken: Data Mining, Web Technology, Programming Language

Sept-Dec 2017
Casual:20hrs/week

Software Engineer, Job Minister Inc, Canada [Canadian job search portal]
Tech Stack: Python, Django, MySQL, NodeJS, Docker
- Developed website to display the jobs collected from different sources.

Aug 2016 - Aug 2017
Fulltime

Project Manager, Amujamu Co., LTD, Thailand [South Asian tourism company @amujamu.com]
Skills: Scrum (Agile), Basecamp, Trello, Jira
- All software and related service development decision making including infrastructure.
- Monitor and manage HR, logistics & procurement and direct software development team.
- Ensuring proper SDLC & Documentation, manage deliverable.

Aug 2015 - Jul 2016
Fulltime

Software Engineer, Prochito IT Solution [A software service company of prochito.com]
Tech Stack: Python, PHP, Symfony, PostgreSQL, MongoDB, Docker, ReactJS, Ansible
- Design & develop database, software architecture including DevOps for multiple projects.
- Worked on web application development, ERP software development and R&D projects.

May 2013 - June 2014
PT 20hrs/week

Senior Web Programmer, Web Technology Bangladesh [Software company works on government projects]
Tech Stack: PHP, CakePHP, Java, MariaDB, PostgreSQL
- Web based PMS software for Educational Engineering Department (EED) of Ministry of Education, Bangladesh
- Management software for Bangladesh Institute of Administration and Management (BIAM)

Feb 2012 - Aug 2015
Contract

Freelancer, oDesk
PHP, Python, CakePHP, Django, Pyramid, Drupal
- Web developing using Frameworks and CMS.
- Served clients from USA (e.g. Incudigm Network, USA) and Europe (e.g. Interfile, Italy).

Grants, Honors & Awards

2024-now

Alberta Innovates Postdoctoral Fellowship (Health Innovation and Enhancement)
- Supports top researchers in the province based on rigorous & competitive application process.

2024-2026 (declined)

Charbonneau CSM-Phillips Scholar Award.

- Recognizes top talents in Cumming School of Medicine through this competitive award. Declined as I received a more prestigious provincial fellowship

2019-24 Eyes High Doctoral Recruitment Scholarship
- The most prestigious internal scholarship at the University of Calgary that recognizes high-achieving doctoral student.

2022 ACHRI Travel Award
- Won competitive travel award from the research institute for presenting impactful research at ASHG conference.

2019-20 Alberta Graduate Excellence Scholarship (AGES)
- Outstanding academic achievements recognized by government of Alberta.

2019-20 Entrance Award
- Competitive award based on profile merit for entering graduate student

2018 Global WordNet Conference Travel Award
- Won competitive travel award conference committee for attending the conference.

2017 Vice Chancellor's Gold Medal
- For M.S. Research work on Bengali WordNet.

2017 Magna Cum Laude
- For maintaining excellent academic result throughout my enrollment.

2016-17, National ICT Fellowship from Bangladesh Government
2017-18 - Research fellowship for two consecutive year from ICT division of Bangladesh Government

2012-15 Full Free Scholarship
- 100% scholarship grant through out my undergraduate degree.

Tech Exposure

→ Apart from the skills I gained through my experiences, my skills expand to:
JS • HTML5 • CSS3 • AngularJS • C/C++ • Java • Android App Development • Laravel • Weka • Git • Git-LFS • DVC •

Community Engagement, Organizational & Other Activities

2025 Patient Research Advocate (PRA), STARS Program, International Association for the Study of Lung Cancer (IASLC)
- Represent patient perspectives, contributing to global advocacy and patient-centered lung cancer research.

2025 Patient Advocate, Canadian Ros1ders
- Support and represent patients with ROS1-positive cancers; promote awareness, education, and research collaboration within a global community.

2025 Admission Application Reviewer, Bachelor of Health Science (BHSc.), Cumming School of Medicine, University of Calgary
- Evaluated and scored 120+ applicant files for admission to a competitive program.

2024-now Peer Reviewer, GENETICS & G3

2024 Grant Application Reviewer, The Digital Research Alliance of Canada (the Alliance), DRI EDIA Champions Pilot Program - Medical and Health Sciences Subcommittee
- Reviewed and evaluated medical and health sciences proposals with focus on EDIA in digital research.

2023 Cover Design, G3 - Genes|Genomes|Genetics, November 2023
- Designed journal cover art featuring our work on MOM: Model Organism Modifier genomic pipeline

2023, 2024 Poster Judge, CURE - a Course-based Undergraduate Research Experience, University of Calgary

2023 Poster Session Judge, Alberta Children's Hospital Research Institute, Annual Retreat - 2023, Banff

2022 Director (Social & Community Outreach), Alberta Children's Hospital Research Organization Trainee Association
- Organized social events with 100+ trainees, monthly activities (e.g., skating, Banff trip), and a toy drive for children with a nonprofit partners.

2020-21 President, Bangladeshi Scholars' Association, University of Calgary
- Led during COVID-19; launched free home delivery services and virtual community social programs.

2019 Vice President (Finance), Bangladeshi Scholars' Association, University of Calgary
- Budgets, fundraising, and sponsorships; introduced a financing framework making the BSA self-sustaining.

2019 Poster Session Judge, Alberta Children's Hospital Research Institute, Summer Student Research Day, University of Calgary

2019 Mentor, International Student Services, University of Calgary

2018 Instructor of the *Science of Living* class for 6-9th grade students at Cosmo School, Dhaka

2018 Volunteer, Bangladeshi Scholars' Association, University of Calgary

2013 BAPS-BUBT National Programming Camp, Dhaka

2013 GDG-Dhaka DevFest & Hackathon

2013 NSU Cybernauts Programming Contest

2010 Tutoring High School Students
2004 Quantum Method Meditation Course
2005-now Volunteer, Quantum Foundation, Bangladesh

Supervision & Mentorship

2016- Rashidul Hasan Nabil (Professional mentorship, PhD @ Deakin University, Australia)
- I was his supervisor at Prochito ITS. Later on, we worked on one paper independently and I have been to personally mentoring him throughout his academic journey.

2020-2022 Andrew Galbraith (Summer student & bachelor thesis @Tarailo-Graovac Lab, UofC)
- Designed and mentored in execution of his project on predicting structural variant from genomic data

2025 Maria Mansi (Summer student, @Bose Lab, UofC)
- Designed and mentored in execution of her project on creating a single cell transcriptomic atlas for HPV+ oropharyngeal cancer

2025 Jamie MacDonald (Summer student, @Bose Lab, UofC)
- Designed and mentored in execution of her project on benchmarking biological effectiveness of AI models that predicts spatial transcriptomics from pathology slides.

Publications & talks

Refereed Articles

2024 **K.M. Tahsin Hassan Rahit**, Vladimir Avramovic, Jessica X. Chong, Maja Tarailo-Graovac *"GPAD: a natural language processing-based application to extract the gene-disease association discovery information from OMIM"* BMC Bioinformatics 25, 84; https://doi.org/10.1186/s12859-024-05693-x

2023 **K.M. Tahsin Hassan Rahit**, Tatiana Maroilley, Afiya Razia Chida, Filip Cotrá, Victoria Rodrigues Alves Barbosa, Maja Tarailo-Graovac *"MOM: A user-friendly Galaxy workflow to detect modifiers from genome sequencing data using C. elegans"* G3 Genes|Genomes|Genetics, jkad184; https://doi.org/10.1093/g3journal/jkad184

2020 **K.M. Tahsin Hassan Rahit**, Maja Tarailo-Graovac *"Genetic Modifiers and Rare Mendelian Disease"*, Genes 2020, 11(3), 239; https://doi.org/10.3390/genes11030239

2019 **K.M. Tahsin Hassan Rahit**, Rashidul Hasan Nabil, Md Hasibul Huq *"Machine Translation from Natural Language to Code using Long-Short Term Memory"*, Proceedings of the Future Technologies Conference (FTC) 2019, Advances in Intelligent Systems and Computing, vol 1069, doi https://doi.org/10.1007/978-3-030-32520-6_6

2018 **K.M. Tahsin Hassan Rahit**, Tabin Hasan, Md Al-Amin, Zahiduddin Ahmed *"BanglaNet: Towards a WordNet for Bengali Language"*, Proceedings of the 9th Global WordNet Conference (GWC 2018) pages 1-9, Global Wordnet Association, Singapore, ISBN 978-981-11-7087-4, Available Online: https://aclanthology.org/2018.gwc-1.1/

Conference Abstracts & Talks

2023 **K.M. Tahsin Hassan Rahit**, Maja Tarailo-Graovac *"ModSpy: A Machine Learning model detects Genetic Modifiers from Whole Genome Sequencing data of Model Organisms"*, 3rd BioNet Alberta; Edmonton, Alberta

2020 **K.M. Tahsin Hassan Rahit**, Maja Tarailo-Graovac *"Textual Analyses using NVivo on Thousands of Literature to Extrapolate Insight"*, Qualitative Research in a Changing World, NVivo Conference 2020

2019 **K.M. Tahsin Hassan Rahit**, Tatiana Maroilley, Susan Stasiuk, Maja Tarailo-Graovac *"Identifying genetic modifiers from Whole Genome Sequencing data"*, 1st BioNet Alberta; Lethbridge, Alberta

Poster

2023 **K.M. Tahsin Hassan Rahit**, Tatiana Maroilley, Afiya Chida, Filip Cotra, Victoria Rodrigues Alves Barbosa, Maja Tarailo-Graovac *"High Throughput Identification of Genetic Modifiers: A Bioinformatics Approach with Machine Learning"*, 24th International *C. elegans* Conference 2023, Glasgow, Scotland

2022 **[*** Reviewers' Choice Award] K.M. Tahsin Hassan Rahit**, Vladimir Avramovic, Maja Tarailo-Graovac *"A Machine Learning-based approach to extract the gene-disease association discovery information from OMIM"*, American Society of Human Genetics Annual Meeting 2022, Los Angeles, USA

2019 Tatiana Maroilley, Susan Stasiuk, **K.M. Tahsin Hassan Rahit**, Mathieu Meode, Kevin F. O'Connell and Maja Tarailo-Graovac *"High throughput identification of MCCRP2 genetic modifiers using Caenorhabditis elegans"*, American Society of Human Genetics (ASHG) Annual Meeting 2019

2024 **K.M. Tahsin Hassan Rahit** *"Unveiling Variability in Rare Disease-Gene Association using Bioinformatics and AI"*, Doctoral Dissertation. University of Calgary.

2017 **K.M. Tahsin Hassan Rahit** *"BanglaNet: Towards a WordNet for Bengali Language using Cross Lingual WSD"*, Masters Thesis. American International University -Bangladesh (AIUB).

2015 **K.M. Tahsin Hassan Rahit**, Faheem Abrar *"Product Information Indexing Based on Crowdsourced Review Extraction"*, Undergraduate Thesis. American International University -Bangladesh (AIUB).

INVITED TALKS & SEMINAR PRESENTATIONS

Apr 2022 *"Discovering Mendelian Disease Genes: Where do we stand?"* Developmental Biology seminar series, University of Calgary

Jul 2021 *"Identification of Genetic Modifiers using Machine Learning"* Worm seminar series, University of Calgary

May 2020 *"Identification of Genetic Modifiers from Whole Genome Sequencing Data"* Developmental Biology seminar series, University of Calgary

2020 *"Machine Learning & Deep Learning"* MDSC 519: Advanced Bioinformatics, University of Calgary

2019 *"Identification of Genetic Modifiers from Whole Genome Sequencing Data"* Bioinformatics Seminar series, University of Calgary

2019 *"Identifying the Silent Heroes of Nature to Cure Rare Genetic Disorders"*
Knowledge Mobilization Through Community Engagement, Calgary Immigrant Community

2017 *"Handling Software Projects- The Professional Way"*
(Invited) Workshop and training program on professional software development, American International University-Bangladesh(AIUB)

2016 *"The Zen of Python: Python in Depth and its Frameworks"*
(Invited) Day Long Workshop on Python Programming Language for university students, American International University-Bangladesh(AIUB)