Riddhiman Adib, Ph.D.

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- *Postdoctoral researcher with 5+ years of research experience in Machine Learning and Data Science for healthcare.*
- *Specializing in Causal Inference, A/B Testing (Experiment design), Electronic Healthcare Datasets, and Health Informatics.*

PROFESSIONAL EXPERIENCE

Oregon Health & Science University, Oregon Clinical & Translational Research Institute — **Portland, OR**
Informatics Postdoctoral Scholar — *Jun. 2022–Present*

- Led two (2) ***Causal Inference*** based NCATS research proposals and five (5) publication manuscripts involving the causal model generation and effect estimation from observational healthcare data, resulting in publications in top journals
- Collaborated with Investigator(s) in planning, writing, and submitting ***Bioinformatics & Bioethics*** focused NCATS proposals, generating three (3) grant submissions involving PHI data consent management and clinical ontologies

Purdue University, Regenstrief Centre for Healthcare Engineering — **West Lafayette, IN**
Visiting Scholar (Summer Research Intern) — *Summer 2019*

- Generated an underlying structural causal model using ***Causal Inference*** theories from observational datasets on Delirium patients in ICU utilizing multiple causal structure learning algorithms (PC, FCI, MMHC), resulting in an improved understanding of complex causal relationships in healthcare data

Marquette University, Ubicomp Lab — **Milwaukee, WI**
Graduate Assistant — *Aug. 2017–May 2022*
Research Assistant (Jun 2018–May 2021) and Teaching Assistant (Aug 2017–May 2018, Aug 2021–May 2022)

- Developed mobile app for Two (2) mHealth projects and managed the project pipelines
- Tutored in courses titled Calculus 1, Calculus 2, Programming Languages & Introduction to Programming

Harriken.com Limited — **Dhaka, Bangladesh**
Software Engineer — *Oct. 2015–May 2017*
Android Lead (Apr 2016–May 2017) and Software Developer (Oct 2015–Mar 2016)

- Designed, planned, & deployed a restaurant-discovery Android app with a user-friendly interface, real-time location-based recommendations, & personalized search filters, resulting in 10K+ Google Play Store downloads
- Aided in system architecture design and data management system with APIs, resulting in smoother connectivity between the web portal, Android, and iOS application

EDUCATION

Marquette University — **Milwaukee, WI**
Ph.D. in Computer Science *(GPA: 3.96/4.0)* — *Aug. 2017–May 2022*

- ***Ph.D. Dissertation Title:*** Causal Inference in Healthcare: Approaches to Causal Modeling and Reasoning through Graphical Causal Models

Marquette University — **Milwaukee, WI**
Masters in Computing (Specialization: Big Data & Data Analysis) *(GPA: 3.96/4.0)* — *Aug. 2017–May 2020*

- ***Relevant Courses:*** Advanced Machine Learning, Advanced Data Science, Introduction to Intelligent Systems, Social and Ethical Implications of Data

Bangladesh University of Engineering and Technology — **Dhaka, Bangladesh**
Bachelor of Science in Electrical & Electronics Engineering *(GPA: 3.32/4.0)* — *May 2010–Sep. 2015*

SKILLS AND CERTIFICATES

- ***Programming Languages:*** Python *(Most proficient)*, SQL, Java, Matlab
- ***Frameworks and Tools:*** Pandas, Scikit-learn, Do-Why, bnlearn, Android Framework, Django, Cosmos in Epic, AWS
- ***Research Area:*** Causal Inference, A/B Testing, Machine Learning, Data Science, Artificial Intelligence, Bioinformatics,mHealth
- ***Soft Skills:*** Critical thinking, Fast-learning capabilities, Collaboration experiences, Strong interpersonal skill, Multi-tasking
- ***Online Certifications:***
  - PH559x: Causal Diagrams: Draw Your Assumptions Before Your Conclusions (certificate)
  - Neural Networks and Deep Learning (certificate)
  - Programming Mobile Applications for Android Handheld Systems: Part 1 & 2 (certificate)

RESEARCH EXPERIENCE

- ***Causal Inference:***
  - Backdoor adjustment of structural causal models in estimation of the Hazard ratio for survival analysis
  - Calculation of causal effects of drug interventions *(anti-psychotic drug intervention on delirium patients in the ICU)*, with Structural causal models, from observational electronic healthcare data
  - Causal graph identification through the merging of causal DAGs generated from data and background knowledge
- ***Bioinformatics & Bioethics:***
  - Curation of a targeted population *(around 1400 Delirium patients in the ICU)* and relevant covariates from large electronic healthcare data *(MIMIC-III, about 50k patient healthcare data across multiple dimensions)* using PostgreSQL
  - Extraction of targeted population subgroup *(rare disease patient population)* from N3C Covid cohort *(largest de-identified clinical healthcare dataset for COVID-19 research in the USA, with ~20M patient population and ~8M Covid cases)*
  - *o* Consent management for the application of patient/consumer-powered health data and its legal & ethical perspective
  - Usage of medical Ontology *(SNOMED CT)* in generating evidence for hypothesis building through Causal Inference
- ***Broader AI & ML:***
  - Exploration of Twitter text dataset of happy moments and related predictive analysis
- ***mHealth:***
  - Design and development of a mHealth App (myFAMI) for self-management intervention for family members of pediatric transplant recipients
  - Design and development of an electronic peer-mentor support application (iPeer) for improving the mental health of Veterans

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SELECTED PUBLICATIONS

- Adib, R., Griffin, P., Ahamed, S. I., & Adibuzzaman, M. (2020, September). A causally formulated hazard ratio estimation through backdoor adjustment on structural causal model. In Machine Learning for Healthcare Conference. PMLR. (link)
- Adib, R., Gani, M. O., Ahamed, S. I., & Adibuzzaman, M. (2022). Causal Discovery on the Effect of Antipsychotic Drugs on Delirium Patients in the ICU using Large EHR Dataset. arXiv preprint arXiv:2205.01057. *(Under review in Nature Scientific Reports)* (link)
- Adib, R., Naved, M. M. A., Fang, C. H., Gani, M. O., Grama, A., Griffin, P., ... & Adibuzzaman, M. (2022). CKH: Causal Knowledge Hierarchy for Estimating Structural Causal Models from Data and Priors. arXiv preprint arXiv:2204.13775. *(Under review in Artificial Intelligence in Medicine)* (link)
- Gani, M. O., Kethireddy, S., Adib, R., Hasan, U., Griffin, P., & Adibuzzaman, M. (2023). Structural causal model with expert augmented knowledge to estimate the effect of oxygen therapy on mortality in the ICU. *Artificial Intelligence in Medicine*, *137*, 102493. (link)
- Adib, R., Aldawod, E., Lang, N., Lasswell, N., & Guha, S. (2019, July). Analyzing Happiness: Investigation on Happy Moments using a Bag-of-Words Approach and Related Ethical Discussions. In 2019 IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC). IEEE. (link)
- Adib, R., Das, D., Ahamed, S. I., & Lerret, S. M. (2022). An mHealth App-Based Self-management Intervention for Family Members of Pediatric Transplant Recipients (myFAMI): Framework Design and Development Study. JMIR nursing. (link)
- Roushan, T., Adib, R., Johnson, N., George, O., Hossain, M. F., Franco, Z., ... & Ahamed, S. I. (2019, July). Towards predicting risky behavior among veterans with PTSD by analyzing gesture patterns. In 2019 IEEE 43rd Annual Computer Software and Applications Conference (COMPSAC). IEEE. (link)

OPEN-SOURCE CONTRIBUTIONS

- **BottomNavBar** ***(207 Github stars)***:
  Open-source Android library to add a bottom navigation bar to the app (URL: https://github.com/adib2149/BottomNavBar)
- **FormMaster** ***(156 Github stars)***:
  Open-source Android library to easily build and use larger forms (URL: https://github.com/adib2149/FormMaster)

SERVICES AND CO-CURRICULAR

- ***Program committee member*** and ***peer reviewer*** for multiple conferences
  - AAAI ’23, UAI ’22-’21, AISTATS ’22, ACM CHIL ’22, AMIA ’22-’20, COMPSAC ’22-’21, NeurIPS ’20 (*Student volunteer*) and few more
- ***Invited talk*** on ‘Introduction to Causal Inference’ for ‘Machine Learning Principles’, Spring 2021 at Marquette University

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LEADERSHIP AND ACCOMPLISHMENTS

- ***General Secretary***, BUET Film Society *(Oct 2014 - May 2015)*
- ***Marquette Computer Science Summer Research Fellow*** *(Summer 2021)*