Mohammad Ridwan Kabir

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Portfolio of Previous Projects
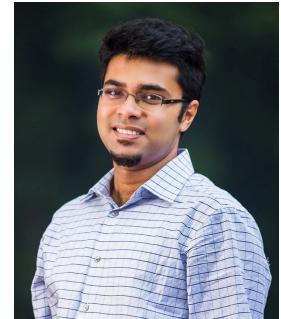
Multifaceted and **Conscientious** educator and researcher with track record for consistently **engaging** students in **stimulating** and relevant materials. **Expert** in leveraging in-depth knowledge and experience in **Human Computer Interaction (HCI)**, **Embedded Systems**, and **Data Analytics** to provide pertinent information and first-hand experiences. **Results-oriented** and **charismatic** orator **capable** of **adapting** presentations to reach an audience of diverse backgrounds, **cognizant** of test preparedness and student interest, **adapting** to feedback where necessary. Known for great **personable demeanor** and **strong work ethic**.

Professional Experience

Islamic University of Technology (IUT)   **August 2022 - Present**
Assistant Professor (Full-time), Department of Computer Science and Engineering (CSE)

- Evaluated and revised lesson plans and course content to achieve student-centered learning.
- Delivered engaging curriculum through diverse methods, including classroom instruction, computer lab activities and online learning systems.
- Oversaw student projects and advised on focus, methodology and report generation to meet preset standards.
- Inspired discussions through presentation of thought-provoking material, preparing students for rigors of HCI, Embedded Systems, Machine Learning, and Computer Vision fields.

Islamic University of Technology (IUT)   **February 2018 - August 2022**
Lecturer (Full-time), Department of Computer Science and Engineering (CSE)

- Evaluated and revised lesson plans and course content to achieve student-centered learning.
- Delivered engaging curriculum through diverse methods, including classroom instruction, computer lab activities and online learning systems.
- Oversaw student projects and advised on focus, methodology and report generation to meet preset standards.
- Inspired discussions through presentation of thought-provoking material, preparing students for rigors of HCI, Embedded Systems, Machine Learning, and Computer Vision fields.

BRAC University   **January 2018 - February 2018**
Lecturer (Full-time), Department of Computer Science and Engineering (CSE)

- Evaluated and revised lesson plans and course content to achieve student-centered learning.
- Delivered engaging curriculum through diverse methods, including classroom instruction, computer lab activities and online learning systems.

Skills Summary

- **Languages**: Python, C, C++, JAVA, JavaScript, HTML5, CSS, SQL, Shell Scripting.
- **Frameworks**: PyQT5, PySide2, PyAutoGUI, PyGame, Scikit, TensorFlow, OpenCV.
- **Tools**: PyCharm, Jupyter Notebook, Google Collab, CodeBlocks, Fusion 360, Git, MySQL, SQLDeveloper, Netbeans, Oracle DB, Microsoft Office Suite, Latex, 3D Printing, Ultimaker Cura.
- **Platforms**: Windows, Linux, Arduino, ESP32.
- **Soft Skills**: Leadership, Team Player, Event Management, Writing, Public Speaking, Time Management.

EDUCATION

- **Masters of Science (M.Sc.) in CSE**   **February 2019 - April 2022**
  Islamic University of Technology (IUT)   *Boardbazar, Gazipur - 1704, Bangladesh*
  CGPA: *3.96* out of *4.0*; **First Class** *with* **Honors**

- **Bachelor of Science (B.Sc.) in CSE**   **December 2013 - November 2017**
  Islamic University of Technology (IUT)   *Boardbazar, Gazipur - 1704, Bangladesh*
  CGPA: *3.91* out of *4.0*; **First Class** *with* **Honors**
  Position in Class: *2* out of *43* students

- **Higher Secondary Certificate (H.S.C)**   **June 2011 - August 2013**
  Rajuk Uttara Model College (RUMC)   *Uttara Model Town, Dhaka - 1230, Bangladesh*
  GPA: *5.0* out of *5.0*

- **Secondary School Certificate (S.S.C)**   **May 2011**
  Rajuk Uttara Model College (RUMC)   *Uttara Model Town, Dhaka - 1230, Bangladesh*
  GPA: *5.0* out of *5.0*

ACADEMIC PROJECTS

- **EyeGaze-based approach for optimizing the design of digital food menus at restaurants**: An ongoing student project that aims to develop a framework to analyze eye-gaze patterns of customers at any restaurant for suggesting optimized menu design patterns considering state-of-the-art HCI frameworks and practices.

- **TeachMe: Your disability is my ability**: An ongoing student project under my supervision that aimed to develop a web-based platform for facilitating the teaching and evaluation of children with learning disabilities. A few features include learning to write alphabets and numerals through a connect the dot game and identifying shapes and colors through a quiz-based approach.

- **Spidey: Web Interface Controlled Four Wheeler using Web Sockets over Local WiFi**: A prototype of a four-wheeler featuring the ESP32CAM module, controlled via a web portal, developed using HTML5 and CSS.

- **Training Data Acquisition Interface for Wireless Air Writing Recognition**: A software developed in Python, using the PyAutoGUI framework for visualizing and recording finger and arm motion data in real-time, generated while writing a character of any language on air. Corresponding motion data were registered wirelessly using the NRF24L01+ wireless module and Arduino from an Inertial Measurement Unit (IMU), which can be worn on the Index finger. The interface minimizes the hassle of manually organizing training data for Air Writing recognition by automatically organizing them into corresponding folders.

- **Human Gait Metrics Measurement Interface**: A software developed in Python, using the PyQt5 framework for real-time visualization of human gait-related metrics, which were derived from gait data acquired wirelessly using Arduino, NRF24L01+ wireless modules, wearable Pressure Sensors, and wearable Inertial Measurement Units (IMUs). A particular use case of this interface is to facilitate the measurement of the quality of human gait in a particular environment.

- **Autonomous Luggage Carrier for the Elders**: A prototype developed using Arduino and Sensor Technologies that can either be manually controlled by the user leveraging wireless communication or autonomously follow the user deploying trilateration with the help of Bluetooth RSSI.

- **Hotel Management System (HMS)**: A software developed using Visual Studio, MySQL and VisualBasic as part of Database Management course.

- **Library Management System (LMS)**: A software developed using JAVA and Oracle DB for simulating different events that are important for managing a library through proper requirement analysis and for gaining hands on experience of database operations.

- **Mobile Phone Simulation Project**: A software developed using C++ to simulate the features of a basic mobile phone.

- **IUT Pocket Allowance Management System**: A software developed using C to simulate the student pocket allowance management system as per IUT rules and regulations.

THESIS WORKS

- **A Sensor-Based Wireless Head-Mounted Mouse for People with Upper Limb Disability**: A prototype device developed using Arduino and Wearable Sensors that will allow people with upper limb disability to interact with a computer using head movements and cheek muscle twitches. [**M.Sc. Thesis**] [Project Demo Video]

- **Sensor Based Post Stroke Arm Rehabilitation**: A prototype device developed using Arduino and Wearable Sensors that will help physiotherapists enhance the accuracy and efficiency of therapeutic interventions for post stroke arm rehabilitation. [**B.Sc. Thesis**] [Project Demo Video]

PUBLICATIONS

- **Journals**   Published: 5 | Under Review: 4

  - M.R. Kabir, H. Mahmud and M.K. Hasan, "Acceptability of a head-mounted assistive mouse controller for people with upper limb disability: An empirical study using the technology acceptance model," in PLOS ONE 18(10): e0293608, 2023, doi: 10.1371/journal.pone.0293608. [**Published**]

  - S. A. Sabab, M. R. Kabir, S. R. Hussain, H. Mahmud, H. A. Rubaiyeat and M. K. Hasan, "VIS-iTrack: Visual Intention Through Gaze Tracking Using Low-Cost Webcam," in IEEE Access, vol. 10, pp. 70779-70792, 2022, doi: 10.1109/AC-CESS.2022.3187969. [**Published**]

  - M. R. Kabir, M. I. Abedin, R. Ahmed, H. Mahmud and M. K. Hasan, "ANTASID: A Novel Temporal Adjustment to Shannon's Index of Difficulty for Quantifying the Perceived Difficulty of Uncontrolled Pointing Tasks," in IEEE Access, vol. 10, pp. 21774-21786, 2022, doi: 10.1109/ACCESS.2022.3151696. [**Published**]

  - I. J. Ratul, U. H. Wani, M. M. Nishat, A. Al-Monsur, A. M. Ar-Rafi, F. Faisal and M. R. Kabir, "Survival Prediction of Children Undergoing Hematopoietic Stem Cell Transplantation Using Different Machine Learning Classifiers by Performing Chi-squared Test and Hyper-parameter Optimization: A Retrospective Analysis," 2022, doi: 10.1155/2022/9391136. [**Published**]

  - A. B. M. Ashikur Rahman et al., "Two Decades of Bengali Handwritten Digit Recognition: A Survey," in IEEE Access, vol. 10, pp. 92597-92632, 2022, doi: 10.1109/ACCESS.2022.3202893. [**Published**]

  - M. Kabir, M. R. Kabir, and R. S. Islam, "Islamic Lifestyle Applications: Meeting the Spiritual Needs of Modern Muslims," 2024. doi: 10.48550/arXiv.2402.02061. [**Under Review**]

  - M. R. Kabir, M. I. Abedin, R. Ahmed, S. B. Ashraf, H. Mahmud, and M. K. Hasan, "Auxilio: A Sensor-Based Wireless Head-Mounted Mouse for People with Upper Limb Disability," 2022, doi: 10.48550/arXiv.2210.04483. [**Under Review**]

  - M. R. Kabir, M. A. Jawad, M. Ehsan, H. Mahmud, and M. K. Hasan, "Renovo: Prototype of a Low-Cost Sensor-Based Therapeutic System for Upper Limb Rehabilitation," 2021, doi: 10.48550/arXiv.2109.03631. [**Under Review**]

  - F. Saad, H. Mahmud, M. R. Kabir, M. A. Shaheen, P. Farastu and M. K. Hasan, "A Case Study on the Independence of Speech Emotion Recognition in Bangla and English Languages using Language-Independent Prosodic Features," 2021, doi: 10.48550/arXiv.2111.10776. [**Under Review**]

- **Datasets**   Published: 3 | Under Review: 0

  - M. R. Kabir, F. Hussain, S. Begum, M.U. Ahmed, and M. M. Alam (2024). "MONITOR PhysiCube Dataset: Dataset of Physiological Parameters for Monitoring Stress in Garments Workers using PhysiCube Sensors [Data set]". Zenodo. doi: 10.5281/zenodo.11518751. [**Published**]

  - M. R. Kabir, F. Hussain, S. Begum, M.U. Ahmed, and M. M. Alam (2024). "MONITOR Shimmer Dataset: Dataset of Physiological Parameters for Monitoring Stress in Garments Workers using Shimmer Sensors [Data set]". Zenodo. doi: 10.5281/zenodo.11523283. [**Published**]

  - M. R. Kabir, H. Mahmud, and M. K. Hasan. (2023). "TAM survey questionnaire responses of a head-mounted assistive mouse controller for people with upper limb disability [Data set]". Zenodo. doi: 10.5281/zenodo.8326513. [**Published**]

- **Softwares**   Published: 1 | Under Review: 0

  - M. R. Kabir, M. I. Abedin, R. Ahmed, H. Mahmud, and M. K. Hasan. (2021). "Popper : A Data Collection Tool for Analyzing Human Performance in Pointing Tasks, applying Fitts's Law (Popper_V1.0)". Zenodo. doi: 10.5281/zenodo.5524603. [**Published**]

HONORS AND AWARDS

- *Champion*: APICTA Awards 2020-21 in Research and Development, for the project, "*AUXILIO: A Head-mounted Mouse for People with Upper Limb Disability*". [**2021**]

- *Winner*: BASIS National ICT Awards 2020 in Research and Development, for the project, "*Renovo: An Orthotic Quantitative Assessment and Visualization System for Hemiplegic Upper Limb Rehabilitation*". [**2020**]

- *Top 5 Innovative Projects Award*: BASIS Soft Expo 2020 for the project, "*AUXILIO: A Head-mounted Mouse for People with Upper Limb Disability*". [**2020**]

- *Champion*: IUT Esonance 2017 in the Project Showcasing event for the project, "*Sensor-based Arm Rehabilitation for Post Stroke Patients*". [**2017**]

- *Runners Up*: IUT 8th National ICT Fest 2016 in the Project Showcasing event for the project, "*Autonomous Luggage Carrier for the Elders*". [**2016**]

Training

- Attended training program on "*Quality Assurance through Outcome Based Education (OBE)*" held at Islamic University of Technology (IUT), Boardbazar, Gazipur - 1704, Bangladesh. **[April 06, 2021 - April 08, 2021]**

- Attended workshop on "*Mobile Application Development*" held by the ICT Division, Bangladesh. **[2021]**

- Attended industrial training program at XeonBD organized by Islamic University of Technology (IUT), Boardbazar, Gazipur - 1704, Bangladesh. **[November 05, 2016 - December 08, 2016]**

References

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