Hamza Reza **Pavel**

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Education

The University of Texas at Arlington
Arlington, Texas, USA

PH.D. IN COMPUTER SCIENCE — *Aug. 2019 - Present*

- **Related Coursework:** Machine Learning, Neural Networks, Data Mining, Advanced Topics in Database Systems, Distributed Systems, Parallel Processing, IoT and Networking, Advanced Topics in Software Engineering, Data Analysis and Modeling Techniques, Design and Analysis of Algorithms, Special Topics in Advanced Intelligent Systems

Shahjalal University of Science and Technology
Sylhet, Bangladesh

B.SC. IN COMPUTER SCIENCE AND ENGINEERING — *Jan. 2011 - Sep. 2015*

- **Related Coursework:** Operating System and System Programming, Microprocessor and Interfacing, Software Engineering, Computer Graphics and Image Processing, Artificial Intelligence, Compiler Construction, Advanced Database Systems, Digital Signal Processing

Skills

Programming Languages	Python, C/C++, C#, F#, JAVA, LaTeX, R, JavaScript, TypeScript, SQL, Bash, Matlab
Web	HTML, CSS, React, Node.JS
Libraries and Frameworks	Keras, TensorFlow, Numpy, Scikit-learn, OpenCV*

Research Experience

The University of Texas at Arlington
Arlington, Texas, USA

HERACLEIA HUMAN-CENTERED COMPUTING LAB — *Jan 2022 - Present*

- Worked on a project called ATEC to identify embodied cognition in children through physical activities. Computer vision and deep learning was used to identify the activity and automate the scoring system.
- Worked a project to identify cognitive fatigue from gait cycle analysis using computer vision. The proposed system has an accuracy of 81%.

The University of Texas at Arlington
Arlington, Texas, USA

INFORMATION TECHNOLOGY LAB — *Jan 2021 - August 2021*

- Developed multiple novel algorithms to detect degree and closeness centrality hubs in Homogeneous Multi-layer Networks using decoupling (divide-and-conquer) based approach developed in IT Lab at the UTA. Our developed algorithms are a few times faster compared to the aggregation-based approach with an accuracy of around 70-80%.
- Ran experiments in the SDSC Expanse supercomputer with datasets of varying characteristics to validate the output of the developed algorithms.

Work Experience

The University of Texas at Arlington
Arlington, Texas, USA

GRADUATE TEACHING ASSISTANT — *Aug. 2019 - Present*

- Worked as a TA for *Introduction to Programming* and *DBMS Models and Implementation* course.

Chaldal Limited
Dhaka, Bangladesh

SENIOR SOFTWARE ENGINEER — *Aug. 2018 – Jul. 2019*

- Chaldal is a grocery delivery company. Worked in a team to develop a tool named *TypeAlgebra* to generate service layer APIs and front-end code from state machines written in *F#* functional programming language. The generated APIs are fully functional with a database to store and retrieve information. This tool was used to create in-house services to support and automate different steps of grocery delivery which cut the development time by around 70%. The tool was developed using F# language and the Fable framework.
- Developed the back-end of in-house communication tools to replace email using *TypeAlgebra*.
- Implemented a verification system for products purchased using international credit cards.

Enosis Solutions Limited
Dhaka, Bangladesh

SOFTWARE ENGINEER — *Oct. 2015 - Jul. 2018*

- Worked in a team to add various functionalities to a framework named *Visual Host* which is a GUI framework written in *C++*. The framework uses *MFC*, *OpenGL* and *Windows API* and supports both Windows and Linux platforms. The Visual Host framework is used by ESI Group to develop GUI for their Visual Environment CAE platform.
- Worked in a team to develop the GUI for a CAD application to visualize the outputs of thermal and static simulations. The used language was C++ with Qt and OpenGL frameworks.

Projects

Reverse Engineering React Native Code from Mobile GUI

Arlington, Texas

The University of Texas at Arlington

- The Rico dataset contains a repository of screenshots and view hierarchy JSON of 9K different android mobile apps. We generated functional React Native code from the view hierarchy JSON which can be run in both Android and iOS platforms.
- Style information such as background color, text color were obtained from the screenshot using color histogram analysis *(CHA)* method.
- The tool is built using Python and Javascript language. The Scikit library was used for color clustering used in the CHA method.

IoT on Ti Microcontroller

Arlington, Texas

The University of Texas at Arlington

- Implemented the RFC 2131 network protocol in a Texas Instrument Tiva series microcontroller. Wrote the DHCP client firmware in C with complete state machine support defined in RFC 2131.
- Wrote a TCP server on the same microcontroller for telnet clients.
- Wrote an MQTT client code with support for IFTTT commands for remote execution in the microcontroller.

Detecting Fake Movie Reviews from IMDB dataset

Arlington, Texas

The University of Texas at Arlington

- Detected fake/anomalous review from the IMDB movie dataset as Machine Learning project. The dataset was pre-processed by removing stop words, stemming, and infrequent word removal. The fake/anomalous movie reviews were detected using a Variational Autoencoder with an accuracy above 90%.
- The Python programming language was used for the project. For implementing the Autoencoder the Keras library was used.