Sonjoy Kumar Paul

skpaul@tamu.edu | LinkedIn | https://sonjoykp.github.io/ | GitHub | (313)-213-9341

CAREER SUMMARY

- Conducting advanced research in Neuro Security and Brainwave Privacy, focusing on privacy attacks and defenses on Brain-Computer Interface (BCI) devices at SPIES Research Lab under Dr. Nitesh Saxena.

- 5 years of professional experience as a C++ software engineer in large-scale portfolio management and credit analysis software applications for Investortools with a code base of over 2 million lines. Many Fortune 500 companies, including many of the largest banks in America, use these applications.

- Solid understanding of data structure and algorithms, system design, software development life-cycle, and agile methodologies.

RESEARCH INTERESTS

- Neuro Security and Brainwave Privacy

- Computer and Network Security

EDUCATION

Texas A&M University   January, 2024 – Present [Transfer In]
Ph.D. in Computer Science   *College Station, Texas*

University of Michigan-Dearborn   January, 2023 – December, 2023 [Transfer Out]
Ph.D. in Computer and Information Science   *Dearborn, Michigan*

Bangladesh University of Engineering and Technology (BUET)   February, 2013 – September, 2017
Bachelor of Science in Computer Science and Engineering   *Dhaka, Bangladesh*

UNDERGRADUATE THESIS

Solving Sudoku as a Constraint Satisfaction Problem and Analyzing Effects of Constraint Ordering:
Sudoku puzzle is a game that is an NP-complete problem, and it can be formulated as a Constraint Satisfaction Problem. In this thesis, we have ordered the constraint based on different criteria to determine the effects of constraint ordering on solving Sudoku. Our experiment result shows the comparative effectiveness of different approaches based on the resolution time and backtrack count.
Supervised by: Abu Wasif, Assistant Professor, Department of CSE, BUET. Email: wasif@cse.buet.ac.bd

WORK EXPERIENCE

Texas A&M University   January, 2024 - Present
Graduate Assistant-Research — SPIES Research Lab, Advisor: Dr. Nitesh Saxena   *College Station, Texas*

- Conducting advanced research in Neuro Security and Brainwave Privacy.
- Investigating various privacy attacks and defenses on Brain-Computer Interface (BCI) devices.
- Engaging in experimental design, data analysis, and the development of new methodologies to enhance the security of BCI devices.

University of Michigan-Dearborn   January, 2023 - December, 2023
Graduate Student Research Assistant   *Dearborn, Michigan*

- I actively contributed to enhancing open-source serverless applications efficiency through GitHub commit analysis, identifying inefficiency patterns. This aids in creating a tool for automated detection and optimization suggestions, boosting serverless application performance. Additionally, I worked on improving the GPU use for accelerated serverless functions, especially for compute-heavy tasks like deep learning and data processing.

CodeCrafters International Ltd.   July, 2022 – December, 2022
Senior Software Engineer   *Dhaka, Bangladesh*

- Improved a template engine that supports multiple template formats such as Word documents, Excel workbooks, and e-mails, featuring expressions and template keywords enclosed within pound signs. During the template merge export process, the engine opens the selected template, searches for relevant keywords and expressions, replaces them with the corresponding results, and saves the export file.

- For training purposes of new developers, I designed and led the development project of an Auction Management System for internal use.

CodeCrafters International Ltd.   July, 2019 – June, 2022

Software Engineer   *Dhaka, Bangladesh*

- Successfully worked with a proprietary software framework, comprising 2 million lines of C++ code.
- Contributed to the platform side of portfolio management and credit analysis software, which is extensively utilized by reputable clients in the United States, including mutual funds, banks, insurance companies, rating agencies, and more. Notably, the software components include CreditScope, Perform, Custom Index Manager, and Smart of Investortools, Inc.
- Improved the performance of the Expression Parser, which is the software platform's core component, and added new functionalities to it.
- Developed a user folder migration feature with a small team that facilitated more than 200 clients in migrating their user reports, graphs, and imports to a new folder structure without causing any disruption to the existing scheduled tasks, batch processes, and favorites.
- Designed and developed a scholarship management system with a small team.
- Integrated several commands to a command line framework that allowed users to generate commands for running reports, sending emails from email templates, and rebuilding databases for various interfaces, including web services, Windows batch processes, internal scheduled tasks, and Python scripts.
- Conducted peer code and design reviews, ensuring exceptional code quality and facilitating the development of expertise.
- Acquired expertise in working with an object-oriented proprietary database system.
- Experienced in a highly customizable proprietary report, graph, and import engine that can handle millions of rows/records.

CodeCrafters International Ltd.   January, 2018 – June, 2019

Software Developer   *Dhaka, Bangladesh*

- Developed a report folder permission feature to enhance data security in the software platform. The feature enables system administrators to create protected folders and assign customized access permissions to individual users and user groups. This addition empowers administrators to restrict access to confidential reports and report settings, improving data privacy and compliance.
- Leveraged Microsoft Foundation Class (MFC) library within Visual Studio to design and create user-friendly desktop interfaces in the Windows environment. Proficient in MFC message handling and command routing, with a proven track record of delivering modules with efficient multiprocess and background process functionality.
- Successfully resolved multiple critical bugs in the software framework through comprehensive analysis, rigorous testing, and strategic implementation of solutions, resulting in improved product stability and enhanced user experience.
- Developed and used an issue/job management platform named ClientScope.

Selected Academic Projects

- **Configuring Hadoop Cluster and Executing Big Data Applications with Apache Spark:** This project aims to configure a Hadoop cluster with Apache Hadoop as the underlying file system and Apache Spark as the execution engine. The main objective is to develop and run various small-scale applications utilizing the power of Hadoop and Spark. The project involves setting up the necessary infrastructure, configuring the cluster, and implementing several applications to leverage the capabilities of these technologies for handling big data efficiently.

- **Enhancing Vending Machine Application with Microservices and Containerization:** This project uses microservices architecture and containerization to improve a vending machine application. By replacing the weather selection mechanism, creating a new microservice for beverage preferences, and updating relevant functions, the project aims to optimize the vending machine application. The utilization of containerization, specifically Docker, facilitates seamless deployment and management of the application, enabling easier scaling and maintenance.

- **AI-Powered Reversi Game:** This project focuses on developing an Artificial Intelligence (AI)-based Reversi game, featuring a visually appealing and interactive game interface created using Java Swing. The game employs the powerful alpha-beta pruning algorithm, enabling the computer player to intelligently determine its next move, resulting in a challenging and strategic gameplay experience for users.

- **4-bit Computer System Design:** We designed a 4-bit Computer System based on Simple As Possible (SAP) architecture. The computer system could run 28 assembly instructions. I was involved in designing the assembly instructions and implementing the system in Proteus Design Suite for simulating the system.

- **Hall Management System:** The project involved the development of a comprehensive system for the university hall office, which included a desktop application with a Java Swing interface for efficient information management. In addition, a web application was created using the Laravel framework, ensuring seamless accessibility and advanced features. Both applications were integrated with a MySQL database to ensure reliable data storage and retrieval, facilitating streamlined administrative processes and enhancing overall efficiency.

- **29 Card Game:** The project involved implementing a 29-card game using Java Multi-threading, enabling concurrent execution of multiple tasks and efficient gameplay. The game's server-client communication was implemented using Java Socket Programming, ensuring reliable and real-time interaction between players. This approach facilitated seamless communication and synchronization between the game server and connected clients, enhancing the overall multiplayer gaming experience.

Technical Skills

- **Programming Languages**: C, C++, Java, Python, JavaScript.

- **Database**: Object-Oriented Database, Oracle Database, MySQL, PostgreSQL, Apache Cassandra.

- **Cloud Computing**: AWS, Apache Hadoop, Apache Spark.

- **Framework**: Spring Boot, Serverless.

Licenses & certifications

Neural Networks and Deep Learning August 2020

Issuing Organization: Coursera, Credential ID: L6CHNWH3FQAC

Awards

2nd Runner-up of Software Project Show: Our team achieved the 2nd Runner-up position in the software project show section at the 2nd International Conference on Networking Systems and Security (NSysS) in 2016. Among 45–50 projects showcased in both hardware and software categories, our Hall Management System Project stood out for its efficiency and user-friendliness.

References

Abu Wasif
Associate Professor, Department of CSE, BUET.
Email: wasif@cse.buet.ac.bd
Contact No.: (+88) 01719-091386

Ellis Miller
Managing Director, CodeCrafters International Ltd.
Email: ellis.miller@codecraftersintl.com
Contact No.: (+1) 620-725-0226