Protik Bose Pranto

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Education

Arizona State University *August, 2022 - Present*
Ph.D. in *Computer Science*

Bangladesh University of Engineering and Technology *March, 2016 - February, 2021*
Bachelors in *Computer Science and Engineering*

Publication

- **Protik Bose Pranto**, Waqar Hassan Khan, Sahar Abdelnabi, Rebecca Weil, Mario Fritz and Rakibul Hasan. *Poster:* "Understanding the Effect of Private Data in Disinformation Propagation". In: **Accepted** at *Nineteenth Symposium on Usable Privacy and Security*, **SOUPS** (**2023**).

- Waqar Hassan Khan, **Protik Bose Pranto**, Tianyi Yang, Rakibul Hasan. *Poster:* "Exploring Privacy and Security Concerns of EdTech Users: A Qualitative Analysis of User Written Reviews". In: **Accepted** at *Nineteenth Symposium on Usable Privacy and Security*, **SOUPS** (**2023**).

- **Protik Bose Pranto**, Waqar Hassan Khan, Sahar Abdelnabi, Rebecca Weil, Mario Fritz and Rakibul Hasan. *Paper:* "From Bad to Worse: Using Private Data to Propagate Disinformation on Online Platforms with a Greater Efficiency". In: **Accepted** at *Design x Policy*, **CHI Workshop** (**2023**).

- **Protik Bose Pranto**, Bishal Basak Papan, and Md. Saidur Rahman. *Paper:* "k-Safe Labelings of Connected Graphs". In: **Accepted** at *IEEE International Conference on Telecommunications and Photonics*, **ICTP** (**2021**).

- Bishal Basak Papan, **Protik Bose Pranto**, and Md. Saidur Rahman. *Paper:* "On 2-Interval Pairwise Compatibility Properties of Two Classes of Grid Graphs". In: **Accepted** at *The Computer Journal*, **COMPJ** (**2021**).

Other Research/Class Projects

- **Feature-Based App Analysis**
  - Automated exploration of all the features of an app to scrutinize the data collected, by conducting network traffic analysis. In instances where data is obfuscated or altered before transmission, deciphering the associated permission methods becomes challenging. To address this, we employ Frida Hooking to identify the specific permission methods called by the app and understand their utilization.

- **Real-Time Violence Detection from Videos**
  - Detected violations from surveillance video using I3D (video classification model) and OpenPose (real-time multi-person human pose detection library) and applying the Hierarchical Multiple Instance Learning model for the identification of violation patterns.

- **Satire or Fake news? Machine Learning Based Approaches to Resolve the Dilemma**
  - Examined nine widely used traditional machine learning models and three transformer-based traditional models (BERT, XLM-RoBERTa, DistilBERT) to see whether they can distinguish effectively between fake and satirical news. SVM performs better on a small dataset when text preprocessing and stemming are used. However, after text augmentation, the transformer-based model (XLM-RoBERTa) outperforms all other models, achieving 97% accuracy.

- **Bengali Covid Related Fake News Detection**
  - Developed machine learning models to detect fake news in Bengali automatically. The best performing model is BERT, with an F1-score of 0.97. We apply BERT on all Facebook Bengali posts related to COVID-19. We find 10 topics in the COVID-19 Bengali fake news grouped into three categories: System (e.g., medical system), belief (e.g., religious rituals), and social (e.g., scientific awareness).

Research Experience

PERSUE: PrivatE, Reliable and SecUrE Computing Lab *2022 –*
Graduate Student Assistant

Graph Drawing and Information Visualization Laboratory, BUET *2019 – 2021*
Undergraduate Researcher with Prof. Md. Saidur Rahman

Research Area

- Human-Computer Interaction
- Natural Language Processing (NLP)
- Computer Vision
- Usable security and privacy

Invited Talk

- Presented my research work on misinformation in a *Lightning Talk* at ASU CyberSecurity Symposium 2023.

Achievements

- Awarded **USENIX Security Student Grant** *2023*
- Got accepted into the **post-CHI summer school** on Usable Privacy and Security *2023*
- Been awarded the **SCAI Doctoral Fellowship** *2022*
- Completed **Google Foobar Challenge** *2020*
- Ranked 3rd place in **South Asia Center for Media in Development** *2020*
- Winner of the **HackTheCode contest** in **Google Cloud DevFest** *2019*
- Our idea got selected among the **top 30 ideas** in **Eduprenuership Idea Quest** *2017*
- Ranked 3rd place in the hackathon of **IUT ICT Fest** *2017*
- Our team was among the **top 50 teams** in **ICPC Regional Contest** *2017,2016*

Work Experience

PERSUE: PrivatE, Reliable and SecUrE Computing Lab *August, 2022 -*
Graduate Student Assistant

Currently, I am involved in a misinformation project that intersects with privacy, focusing on how individuals can be targeted based on their private data through user surveys and statistical analyses. Another project of mine delves into app analysis, utilizing static and dynamic analyses to understand how apps handle data sharing.

Start Network *March, 2022 - July, 2022*
Consultant

On their Forecast-based, Warning, Analysis, and Response Network (FOREWARN) project, I conducted a Data Science program. I also worked with the team and provide technical assistance in the pursuit of a peer-reviewed publication.

Chaldal Engineering *March, 2021 - February, 2022*
Software Engineer

I have worked in Customer Experience team managing their website, mobile app, order APIs, search catalog and other user-facing services. I also worked in the *EggShell* team, which is a tech stack for front end apps. It combines a number of technologies like React, Fable, ReactXP, RenderDSL, and StyleDSL exhibiting a common framework for both web and android.

Teaching Assistant

- **CSE 100 (Principle of Programming with C++)**
  The course focuses on programming concepts, problem solving, and program design.

- **CSE 477 (Intro Computer-Aided Geometric Design)**
  The course introduces basic concepts of 3-D computer geometry, including curves, surfaces, and meshes.

- **CSE 467 (Data and Information Security)**
  This course is intended to provide students with an introductory understanding of the technical and behavioral mechanisms for information security and privacy.

- **CSE 485 (ASU Capstone Project)**
  It is a project-based course linking students with industry and faculty-sponsored projects, cultivating practical experience and preparing them for the professional world.

Skill

- **Language:** C, C++, Java, R, Dart, Python, HTML, Assembly(80x86), Matlab, SQL, Typescript, F#.
- **Environment:** CodeBlocks, NetBeans, Emu8086, Android Studio, Visual Studio Code, Proteus.
- **Mobile Application Development:** Android, Flutter, React Native.
- **Database:** Oracle, MySQL, SQLite.
- **Tools and Platforms:** Git, Unity, Lucidchart, draw.io, OpenCV, Cuda, JavaFX Scene Builder, Tensorflow, Keras, PyTorch, Scikit-learn, Qualtrics.
- **Other:** Qualtrics, Latex, Microsoft Office, Microsoft Powerpoint, Probability and Statistics, Data Structures, Unity.

Projects

Vasha-Sikkha
Dart

- A flutter framework-based application that helps one learn English in a very interactive way. Users can practice speaking, reading, listening, and writing by completing different tasks. Users' scores are maintained and on completing a lesson, the user score will be updated, and he/she can view his/her ranking in the leaderboard.

CovidLife
Dart

- This is a flutter based health-related android application. Corona details of Bangladesh are shown here. Two built-in APIs are used to provide district wise and daily corona data.
- Doctor appointment,phone call or message can be made easily.

Real-Time Vehicle Detection and Tracking Using a Fisheye Camera
Python

- A dataset of traffic videos from a fisheye camera is trained using the YOLOv5 algorithm.
- Fisheye images are mathematically modified to get a low distortion ratio so that vehicles at the junction can easily be identified.

Cricket Match Prediction
Python

- Data are collected from IPL match records from 2008 to 2019.
- Applied different models like KNN, Logistic Regression, Random Forest, Support Vector Machine, Naive Bayes, Decision Tree, and XGBoost.
- Random Forest Classifier and KNN provides best result.

Gesture Sensed Snake Game
C,C++,Makefile

- This is a hardware project using Atmega32 and Accelerometer sensor.
- Four 8×8 RGB dot matrices are controlled by three types of decoders. Rows are controlled with two 3×8 decoder (IC 74138)

Hotel Management System
Java,SQL

- This is a Java and Oracle Database-based project.
- JavaFX Scene Builder is used for the UI parts.
- In the database system, employees can be identified by their name, address, phone number, id, job title, salary, hire date
- The user can also add, delete, edit the reservation.

References

Dr. Ariane Middel
Associate Professor, School of Computing and Augmented Intelligence, Arizona State University
Email: amiddel@asu.edu

Dr. Md. Saidur Rahman
Professor, Department of Computer Science and Engineering, BUET
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