Xiaoxuan Qin

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SUMMARY

I am a passionate graduate student with a research interest in Network/Information Security. My research has included enhancing a network protocol using deep learning techniques and establishing post-quantum keys in the quantum world. I have hands-on experience in network protocol analysis, penetration testing, and have participated in cybersecurity competitions such as NCL and CTF. And I am positively confronting emerging challenges, striving to contribute to the academia and the society.

NOTABLE SKILLS

- Programming: Python, R, SQL, JAVA, JavaScript, HTML/CSS, C, LaTex
- Techniques: MySQL, Hive, Hadoop(HDFS, MapReduce), NS-3, Wireshark

EDUCATION

Carnegie Mellon University Pittsburgh, PA
Visiting Student 09/2023 -till present

University of Pittsburgh Pittsburgh, PA
Master of Information Science(ongoing) 09/2022 –till present

- Tentative GPA: 3.81/4
- Research area: Network Security and Information Security
- Core Courses and Marks: Information Security and Privacy: A, Network Security, Introduction to Cryptography, Application of Network: A-, Algorithm Design: A, Machine Learning: A

Hubei University of Economics Wuhan, Hubei
Bachelor of Management in Information Management and Information system 09/2017 – 06/2021

- Overall GPA: 86.6/100
- Core Courses and Marks: Computer Applications: 89, Information Security: 80, Linear Algebra 88, Managing System, Technology and Data: 85, Data Structure: 91, Java I: 85, Java II: A+, Database System: A+, Data Communication: A+, Web Application Development: A+

RESEARCH EXPERIENCE

Enhancing Neighbor Discovery in Wireless Sensor Networks Using Deep Learning Techniques
Research Scope: 03/2023-08/2023

The primary objective of this research is to explore the potential of employing deep learning techniques, specifically Multi-Layer Perceptrons (MLP) and Graph Convolutional Networks (GCN), in predicting the neighbors of nodes within a Wireless Sensor Network (WSN). By doing so, we aim to reduce latency and enhance the efficiency of neighbor discovery.

Achievements:

- Conducted a detailed comparative analysis of various protocols, successfully pinpointing Searchlight as a potential candidate for enhancement in neighbor discovery.
- Undertook an extensive comparison of two deep learning models, considering the trade-off between prediction

accuracy and computational resources.

- By integrating the chosen deep learning model into the Searchlight protocol in the WSN with edge computing, the performance of neighbor discovery was effectively enhanced, ensuring more accurate and efficient neighbor discovery.

On Post-Quantum Key Establishment 04/2023-08/2023

Supervisor: Krishnamurthy, Prashant Venkata

Research Scope:

The research focuses on how to enhance the secure data transmission in a post-quantum world of mixed post-quantum and pre-quantum secure flows through the key pre-distribution method.

Achievements:

- **Refined a key pre-distribution scheme to enhance the security of communications in a post-quantum world.**
- **Developed a simulation-based mechanism and figured out an empirical model to guarantee finding a common key between two heterogeneous nodes (a non-post-quantum node and a post-quantum node).**
- **Two strategies are proposed to help quickly build a successful connection between a non-post-quantum node and a post-quantum network.**

ACADEMIC EXPERIENCE

PPG Project based on Machine Learning 03/2023 – 04/2023

Description:

- Developed machine learning models to predict the important property and classify the popularity of paint colors based on inputs from two color models: RGB and HSL.

Responsibilities:

- Performed regression analysis and classification using both non-Bayesian and Bayesian linear models to decipher the influence of color model inputs on a concealed paint property and to discern the popularity of paint colors based on color model inputs.
- Trained and tuned models with more complex methods such as Generalized Linear Model, Elastic Net, Neural Network, Random Forest, SVM, and Gradient-Boosted Tree.
- Tested model performance using RMSE, Accuracy (for classification), and ROC (for classification) to ascertain the most effective predictive model.
- Leveraged the selection of the best models to successfully identify key variables that had a strong impact on the important paint property and the popularity of paint colors.

Database System for E-Commerce 10/2022 – 12/2022

Description:

- A database system designed as an online perfume and body-care shopping system, which displays six categories of products with eight types of scents - aiming at providing customers with an online perfume and body-care shopping experience.

Responsibilities:

- Database Design: Designed and implemented a comprehensive e-commerce database comprised of 10 entities and 10 relationships between them.
- Customer Interface Development: Developed a comprehensive customer interface, that allow customers to register, log in, modify personal information, browse and search items by category or scent, add products to their shopping cart, and complete checkout process securely.

- Manager Interface Development: Designed a comprehensive management portal for site administrators, enabling them to view product details, update product information, manage product availability, and monitor sales data.

(Project available at: https://github.com/Qin99113/22fall_infsci2710_project)

Enhancement of Canvas Search Engine 09/2022 – 12/2022

Responsibilities:

- Contributed to addressing the challenge of insufficient global search capabilities; i.e., through enhancing the ability of the search engine to access and retrieve data from the entire platform of a specific course.
- Perfected the Search Algorithm of Canvas to increase its breadth and precision, implementing both exact search algorithm and fuzzy search algorithm (BM25) and evaluated by MAP, which recorded [relatively] a high score of 0.837
- Refined search results display mechanism to provide users with more relevant, accurate, and intuitive results: this helped to enhance user experience and boost user satisfaction nearly by 50%.

(Project available at: https://youtu.be/FShazMnyVy8)

Data Analysis of Taobao's Singles Day Sales 01/2019 – 02/2019

Responsibilities:

- Constructed a Hadoop cluster on a Linux system, built a Hive data warehouse to store 7027945 pieces of data, and then built MySQL relational database to run real-time query and information visualization and integrated them using Sqoop for efficient data transmission.
- Tackled three problems pertaining to the sales data which allowed for a detailed understanding of consumer behavior and trends, critical for informing targeted marketing strategies and improving customer engagement.

PRACTICAL EXPERIENCE

Hangzhou Xiaomawang Education Technology Co. Ltd. 05/2021- 02/2022

Lecturer of Python Programming

Responsibilities:

- Instructed students in Python programming, starting with fundamental concepts, followed by data structures, then progressing through algorithm development, modular programming, front-end design, and data scraping and culminating in AI programming.
- Guided nearly 90% of students to achieve the Level 3 Python Certificate endorsed by the China Institute of Electronics and received almost 100% positive feedback from students.

SAP 08/2020 - 09/2020

PTA of Intelligent Manufacture Project Group

Responsibilities:

- Developed in-depth analysis of Dissona's Value Stream Mapping, which encompassed customer and market demand, production management, and supply chain system management, and identified critical process bottlenecks.
- Designed and implemented robust information systems (CRM, ERP, SCM, MES) tailored to optimize process and resource management, thereby effectively resolving bottlenecks identified through Dissona's Value Stream Mapping, culminating in a 100% successful transformation towards an intelligent

workshop.

- Attended AI+CRM products seminar, discussing how to integrate AI with CRM to realize personality service to increase efficiency and manage risks.

AWARDS & HONOURS

Canglong Student Scholarship (Twice) (Top 10%);
Specialized Scholarship (Top 5%)

LANGUAGE

Native: Chinese(Mandarin)
Foreign: English(Advanced)

REFERENCES

Prof. Krishnamurthy, Prashant Venkata
School of Computing and Information
University of Pittsburgh
Email: prashk@pitt.edu
Webpage: https://sites.pitt.edu/~prashk/