Pithayuth (Will) Charnsethikul

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Research Interests

My research focuses on understanding human behaviors and perceptions around cybersecurity through variety of data such as client (i.e., user study), system, and social media. The goal is to apply my findings by integrating my expertise in machine learning, specifically in NLP, and the field of security to enhance users' online security and privacy experiences.

Education

University of Southern California, Ph.D., Computer Science — Los Angeles, California
Advisors: Jelena Mirkovic — *2021-present*

University of Southern California, M.S., Computer Science — Los Angeles, California
Specialization: Computer Networks — *2019-2021*

Kasetsart University, B.Eng., Computer Engineering — Bangkok, Thailand
2014-2018

Academic Experiences

Graduate Research Assistant — August 2021–Present
USC Information Sciences Institute (ISI), STEEL: Security Research Lab — *Marina Del Rey, California*

- **Privacy Setting**: conduct a user study (i.e., survey) that investigates how aware social media users are of their privacy settings and the extent to which they make use of them.
- **Anti-Scam**: develop a dialogue system, Puppeteer, that scambaits scammers using a combination of a large language model and state machines; and conduct a user study (i.e., role-play dialogue data collection between human scammers and Puppeteer, followed by a survey) to evaluate the system in different scam scenarios.

Student Worker, Research — August 2019–May 2021
USC Information Sciences Institute (ISI), STEEL: Security Research Lab — *Marina Del Rey, California*

- **Venmo**: build a neural classifier that categorizes Venmo public transactions into multiple sensitive classes.
- **Cloud Misbehavior**: identify which /24 network prefixes are "cloud", then quantify the amount of bad traffic originated from these networks.
- **DDoS Detection**: implement various anomaly detection approaches and evaluate them with the captured traffic.

Directed Research — August 2020–May 2021
Mentor: John Heidemann — *Remote*

- **DNS latency**: modify DNS servers to solicit TCP from selected clients, allowing us to determine RTTs.

Teaching Assistant — January 2023-Present
USC Viterbi Department of Computer Science — *Los Angeles, California*

- **CSCI 430: Introduction to Computer and Network Security**, Fall 2023/Spring 2024/Fall 2024, Instructors: Jelena Mirkovic and Genevieve Bartlett
- **CSCI 567: Machine learning**, Spring 2023, Instructor: Yan Liu

Industry Experiences

Cybersecurity Research Intern — June 2024-August 2024
***PayPal**, Fraud Science & Intelligence, Global Investigations, Mentor: Blake Butler* — *Scottsdale, Arizona*

- Examine automated deployment of scam websites.
- Develop a clustering approach to group scam websites with similar structures into signatures and leverage these signatures to proactively detect automatically generated scam websites.
- Monitor and analyze how these scam websites develop over time.
- Calculate the loss generated by these scam websites and estimate the potential saving if deploying the developed proactive detection.

Applied Scientist Intern May 2023-August 2023

***Amazon**, SCOT-IPC: Specialized Selection* *Bellevue, Washington*

- Analyze customer's search data and calculate basket (i.e., online shopping cart) abandonment probability.
- Comprehensively investigate what drive basket abandonment, e.g., basket size, free shipping threshold, etc.
- Develop a neural network model that predicts the basket abandonment probability given an input of customer basket.

Technical Intern II June 2022-August 2022

***AT&T** Labs Research, Mentor: Anestis Karasaridis* *Remote*

- DNS data collection and analysis, specifically for DNS-over-TLS (DoT) and DNS-over-HTTPS (DoH).
- Add DNS source code (PowerDNS dnsdist) to extract session ID and user-agent from DoT/DoH queries and create a data pipeline to transfer and enrich data between Azure environment and Snowflake.
- Analyze collected data on Azure Databricks.

Publications

- Under Submission: Puppeteer: Crafting a Large Language Model for Scambaiting; **Pithayuth Charnsethikul**, Jelena Mirkovic, Genevieve Bartlett
- GLOBECOMM 2022: AMON-SENSS: Scalable and Accurate Detection of Volumetric DDoS Attacks at ISPs; Rajat Tandon, **Pithayuth Charnsethikul**, Michalis Kallitsis, Jelena Mirkovic
- PETS2022: I know what you did on Venmo: Discovering privacy leaks in mobile social payments; Rajat Tandon, **Pithayuth Charnsethikul**, Ishank Arora, Dhiraj Murthy, Jelena Mirkovic
  Acceptance Rate : 21.02% (33/157)
- PAM2022: Old but Gold: Prospecting TCP to Engineer and Live Monitor DNS Anycast; Giovane C. M. Moura, John Heidemann, Wes Hardaker, **Pithayuth Charnsethikul**, Jeroen Bulten, João M. Ceron and Cristian Hesselman
  Best Paper Award
- CloudNet2020: Quantifying Cloud Misbehavior; Rajat Tandon, Jelena Mirkovic, **Pithayuth Charnsethikul**

Technical Skills

Languages: Python, C, C++, Bash, HTML, CSS, PHP, JavaScript, Typescript, SQL, JAVA, Perl, LaTeX
Frameworks: scikit-learn, PyTorch, Torch, TensorFlow, Keras, Huggingface, Angular, Node.js, Spark
Packages and Tools: NumPy, Pandas, Jupyter Notebook, SciPy, Git, Docker, MySQL, BigQuery
Platforms: Linux, macOS, Windows, Arduino, Raspberry, GCP, Azure, AWS
Networking: tcpdump, Wireshark, Nmap, Knot DNS, dnsdist, urlscan

Graduate Coursework

Advanced Analysis of Algorithms, Applied Cryptography, Foundations of Artificial Intelligence, Machine Learning, Advanced Natural Language Processing, Robustness and Generalization in Natural Language Processing, Advanced Operating Systems, Advanced Computer Networking, Security Systems

Certifications

- Deep Learning Specialization by DeepLearning.AI, Coursera

References

- Jelena Mirkovic, Research Associate Professor, USC ISI, mirkovic@isi.edu
- Genevieve Bartlett, Senior Computer Scientist, USC ISI, bartlett@isi.edu