

Nikolaos Pantelaos

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EDUCATION

North Carolina State University, NC, USA *2018-Present*

PhD, Computer Science - *Supervisor*: Alexandros Kapravelos

Research Interests: **Web Security & Systems, Pattern Recognition & Machine Learning**

National Technical University of Athens(NTUA), Greece *2012-2017*

BSc & MSc in Electrical and Computer Engineering (5-year joint degree; 300 ECTS)

Thesis: Personality Traits Recognition from Speech using Neural Networks

Supervisor: Alexandros Potamianos

EXPERIENCE

Research Intern - Applied Machine Learning, Privacy & Data Infra, Meta, NY *2022*

- Developed metrics for improving the labels of the database columns deploying Word2vec on textual data and unsupervised Machine Learning models
- Saved an estimated \$2.48 Millions/year in CPU and memory infrastructure costs
- Created end-to-end pipelines for querying(Hive, SQL), parsing(Big Data, koski) and extracting metrics(column perplexity) for ~ 1 Trillion **Facebook** and **Instagram** database columns

Research Intern - Product Security & Big Data, ByteDance, CA *2021*

- Categorized failed SSL/TLS **TikTok** certificates from untrusted sources
- Performed exploratory SSL certificate analysis, generated and tested working hypotheses and uncovered new trends and relationships in failed SSL categories
- Analyzed PetaBytes of logs & SSL certificates from **TikTok** interface connections

Research Intern - Product Security & Data Science, ByteDance, CA *2020*

- Developed a comparison system to check for compromised accounts in the **TikTok** user base
- Used Hadoop & Hive to handle Big Data, coding in both Python & GoLang

Research Assistant - Web Security, NCSU *2018 - Present*

- Established proficiency in code development & remote testing using Docker & Kubernetes
- Managed & coordinated research groups from different universities
- Developed desired high-level readable code practices

PUBLICATIONS

Nikolaos Pantelaos, Nick Nikiforakis, Alexandros Kapravelos. You've Changed: Detecting Malicious Browser Extensions through their Update Deltas. In Proceedings of the ACM Conference on Computer and Communications Security (CCS), 2020.

SECURITY PROJECTS

Extension Client-Side JavaScript Evasions *2022 - Present*

- Performed Program Analysis (static & dynamic) to detect JavaScript evasions in browser extensions

- Implemented directed Fuzzing utilizing Control Flow Graphs (CFG), forced code execution, improved code coverage & solved the path explosion problem based on 3rd-party code inclusion points
- Identified previously undetected evasion code & categorized evasion techniques in extensions (Time-bombs, Fingerprinting & Bot evasions)

Bot Detection in Chrome Webstore

2018 - 2020

- Developed a Bot detection system in the Chrome Webstore for fake comments & users in Python

Phishing Pages in the Web

2018 - 2020

- Conceptualized a Phishing Fraud detection system based on image similarity
- Identified novel Phishing evasion techniques (Bot, Fingerprinting)

ML/AI PROJECTS

Malicious JavaScript Sequences - Transformers/LSTM

2022 - Present

- Utilized Transformers & LSTM Models to generate sequences of malicious JavaScript code
- Identified previously undiscovered malicious extensions from API sequence clustering

JavaScript Fuzzing - Testcase Generation and Bug Detection

2021 - Present

- Performed syntactical analysis in Millions of JavaScript testcases
- Extracted code-level features from the newly generated JavaScript
- Trained Javascript testcases with Recurrent Neural Networks (RNN) to reduce the examined testcases
- Executed successful testcases in a browser environment for novel bug detection and crashes discovery

Personality Prediction - Speech Recognition

2016 - 2018

- Designed personality prediction model achieving state-of-the-art results using Tensorflow & Keras

HACKPACK

Hacking Group (HackPack)

2018 - Present

- Leading member of the HackPack community, focused on educational hacking courses
- Participated in CTF competitions coding web and binary exploits (XSS, DoS, ROP)
- Developed custom challenges for HackPack CTF including web & reverse engineering challenges

SKILLS

Programming Languages & Tools

- Python, GoLang, Javascript, R, C, C++, C#, Java, SQL, PostgreSQL, MongoDB, HTML, CSS
- Hive, Hadoop, Tensorflow, Keras, Theano, Kubernetes, Docker, PyTorch, MATLAB, Linux

LANGUAGES

English (fluent), German (basic), Greek (native)

REFERENCES

Available upon request from:

- Parth Patel, Senior Software Engineer, Real Time Machine Learning, Meta
- Cyrille Habis, Team Manager, Real Time Machine Learning, Meta
- Sergey Shekhan, Senior Security & Software Engineer, Automated Traffic Detection, ByteDance
- Alexandros Kapravelos, Associate Professor, Systems & Software Security, NCSU