Ahmet Kurt, Ph.D.

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Summary

Research Interests	○ Cybersecurity, IoT, Blockchain, Wireless Networks, Distributed Systems
PLs	○ Python, C++, C (8 years), Bash (5 years), JavaScript, Rust, Go (2 years).
Skills	○ Linux, Latex, Wireshark, ns-3, CLN, lnd, bitcoind, PyCharm, CLion, VSCode, AWS, GCP, Matplotlib, NumPy, SciPy, TensorFlow, Keras, NetworkX, Pandas.

Education

Ph.D. (2019-2023)	○ Florida International University, Miami, FL, USA (*Advisor*: Prof. Kemal Akkaya) *Major*: Electrical and Computer Engineering (Cumulative GPA: **3.92/4.00**) **Dissertation Title:** Enabling Third Layer Bitcoin Applications Using Lightning Network
M.Sc. (2019-2021)	○ Florida International University, Miami, FL, USA. *Major*: Electrical and Computer Engineering
B.Sc. (2013-2018)	○ Antalya Bilim University, Antalya, Turkey. *Double Major*: Computer Engineering & Electrical and Electronics Engineering

Media Appearances

Featured at	○ **Forbes** ☑, **Decrypt 1** ☑, **Decrypt 2** ☑, **ZenGo** ☑, **FIU News** ☑ and many other smaller sites.

Patents

US 11,755,958 B1	○ Systems and Methods for Detecting Cryptocurrency Wallet Artifacts in a File System ☑

Work Experience

Bryan, TX, USA (Aug 2024–Present)	○ **East Texas A&M University:** *Assistant Professor of Computer Science* – Joined Texas A&M University-Commerce as an Assistant Professor of Computer Science where I will be teaching courses, doing service and conducting research.
Miami, FL, USA (June-Sep 2024)	○ **Nethermind:** *PhD Security Apprentice* – Working on Ethereum smart contract security audits in Nethermind's security team.
Miami, FL, USA (Aug 2023-2024)	○ **Florida International University:** *Postdoctoral Associate* – Worked on various blockchain, security and wireless networks projects.
Miami, FL, USA (Jan 2019- July 2023)	○ **Florida International University:** *Graduate Research and Teaching Assistant*

- **Crypto Wallet Forensics:** An Advanced Crypto Wallet Artifact Detection Framework. Publication: **1** ☑
  - Designed, implemented and tested a Machine Learning based artifact detection framework for crypto wallets.
- **LNMesh:** First Implementation of True Offline Bitcoin Lightning Payments
  - All code & documentation related to the project: ⦿ ☑. Resulting publication: **1** ☑.
  - Tested offline LN payments with WiFi & Bluetooth and implemented a simulator in Python.
- **LNGate & LNGate^2:** First Implementation of a 2-party Threshold Lightning Node
  - All code & documentation related to the project: ⦿ ☑. Resulting publications: **1** ☑, **2** ☑.
  - This work enables secure LN payments for resource constrained devices using threshold cryptography.
- **LNBot & D-LNBot:** First Botnet on Bitcoin's Lightning Network
  - Some (not all) code related to this project: ⦿ ☑. Resulting publications: **1** ☑, **2** ☑.
  - Designed and implemented a covert hybrid botnet running on LN that is extremely hard to stop.
- **Ns-3 Network Simulations:** A Novel Distributed Connectivity Maintenance Algorithm
  - Code: ⦿ ☑. Resulting publications: **1** ☑, **2** ☑.
  - Modified ns-3's IEEE 802.11s HWMP protocol and more in C++.
- Instructor for EEL 3712L – Logic Design I Lab. Main TA for EEL 3110 – Circuit Analysis.

Antalya, Turkey (Dec 2016-2017)	○ **Desird Design R&D:** *Embedded Software Engineer* – Developed software for a product using ESP8266 WiFi Modules in C++/Lua.
Istanbul, Turkey (July-Sep 2017)	○ **Havelsan:** *Intern* – Developed a desktop GUI application using QT in C++.

Bristol, England ○ **University of Bristol:** *Erasmus+ Intern*
(June-Sep 2016)   – Contributed to 'optically reconfigurable microwave switches' research project.

Honors and Awards

Awards ○ FIU Dissertation Year Fellowship [↗]: Supports highly-qualified final-year doctoral students.
○ Black Hat USA 2021, Student Scholarship [↗]: Provides access to all virtual and in-person briefings.
○ RSA 2020 Conference, Security Scholar [↗]: Covers full conference pass, travel, accommodation.

Selected Publications

○ **A. Kurt**, E. Erdin, K. Akkaya, A. S. Uluagac, M. Cebe, (2023). *D-LNBot: A Scalable, Cost-Free and Covert Hybrid Botnet on Bitcoin's Lightning Network*, in **IEEE Transactions on Dependable and Secure Computing**, 1-18 [↗].

○ **A. Kurt**, A. Sahin, R. Harrilal-Parchment, K. Akkaya, (2023). *LNMesh: Who Said You need Internet to send Bitcoin? Offline Lightning Network Payments using Community Wireless Mesh Networks*, in Proceedings of 2023 IEEE 24rd International Symposium on a World of Wireless, Mobile and Multimedia Networks (**WoWMoM**), 261-270 [↗].

○ **A. Kurt**, K. Akkaya, S. Yilmaz, S. Mercan, O. Shlomovits, E. Erdin, (2023). *LNGate^2: Secure Bidirectional IoT Micro-payments using Bitcoin's Lightning Network and Threshold Cryptography*, **IEEE Transactions on Mobile Computing**, 1-17 [↗].

○ A. Bhattarai, M. Veksler, A. Sahin, **A. Kurt**, K. Akkaya, (2023). *Crypto Wallet Artifact Detection on Android Devices Using Advanced Machine Learning Techniques*, in Proceedings of International Conference on Digital Forensics and Cyber Crime (**ICDF2C 2022**), 111-132 [↗].

○ S. Mercan, **A. Kurt**, E. Erdin, K. Akkaya, (2022). *Cryptocurrency Solutions to Enable Micro-payments in Consumer IoT*, in **IEEE Consumer Electronics Magazine**, 11(2):97-103 [↗].

○ **A. Kurt**, S. Mercan, E. Erdin, K. Akkaya, (2021). *3-of-3 Multisignature Approach for Enabling Lightning Network Micro-payments on IoT Devices*, in **ITU Journal on Future and Evolving Technologies**, 2(5):53-67 [↗].

○ **A. Kurt**, S. Mercan, O. Shlomovits, E. Erdin, K. Akkaya, (2021). *LNGate: Powering IoT with Next Generation Lightning Micro-payments using Threshold Cryptography*, in Proceedings of the 14th ACM Conference on Security and Privacy in Wireless and Mobile Networks (**WiSec '21**), 117-128 [↗].

○ **A. Kurt**, S. Mercan, E. Erdin, K. Akkaya, (2021). *Enabling Micro-payments on IoT Devices using Bitcoin Lightning Network*, in Proceedings of 2021 IEEE International Conference on Blockchain and Cryptocurrency (**ICBC**), 1-3 [↗].

○ **A. Kurt**, N. Saputro, K. Akkaya, A. S. Uluagac, (2021). *Distributed Connectivity Maintenance in Swarm of Drones During Post-Disaster Transportation Applications*, in **IEEE Transactions on Intelligent Transportation Systems**, 22(9):6061-6073 [↗].

○ **A. Kurt**, E. Erdin, M. Cebe, K. Akkaya, A. S. Uluagac, (2020). *LNBot: A Covert Hybrid Botnet on Bitcoin Lightning Network for Fun and Profit*, in Proceedings of 25th European Symposium on Research in Computer Security (**ESORICS 2020**), 734-755 [↗].

○ **A. Kurt**, K. Akkaya, (2020). *Connectivity Maintenance Extensions to IEEE 802.11s MAC Layer in ns-3*, in Proceedings of the 2020 Workshop on ns-3 (**WNS3 '20**), 17-24 [↗].

Languages

Turkish ○ *Native*
English ○ *Proficient*