Dimitrios Karnikis

dkarnik.is

Profile

Embedded software developer specialized in creating high-quality, reliable solutions for embedded devices, with a focus on Bluetooth wireless technology and system security. My background in both academic research and industrial R&D enables me to effectively bridge the gap between architectural design and hands-on development. I am dedicated to enhancing the system operation, ensuring robustness, integrity and stability.

Work Experience

- **Bang & Olufsen A/S** — **Kongens Lyngby, Denmark**
  Embedded Software Developer — *October 2022 – Present*
  - Ensured high reliability and seamless functionality across all Bluetooth-enabled devices.
  - Developed production-ready BLE protocol using Protobuf and GATT services for remote device control.
  - Created low-level drivers for Zephyr OS.
  - Engineered standalone D-Bus service for remote SSH control and system recovery.
  - Implemented CMake and shell scripts to streamline development processes.

- **Aarno Labs** — **Remote, US**
  Freelance Software Engineer, TEE's, High-level Languages, CI/CD — *February 2021 – April 2022*
  - Developed security applications embedded based on Trusted Execution Environments (TEE).
  - Provided a secure subset of instructions for high-level runtimes (QuickJS, Lua).
  - Designed offloading techniques for low-end IoT devices.
  - Developed automation scripts for PaSh's CI/CD infrastructure.

- **DiSCS Laboratory, FORTH-ICS** — **Heraklion, Greece**
  Postgraduate Research Fellow, Intel SGX, Arm TrustZone — *February 2019 – February 2021*
  - Enhanced Lua language runtimes with TEE capabilities (Intel SGX).
  - Introduced memory and type-safe operations for TEE applications.
  - Offered high-level bindings to the underlying TEE native calls.
  - Addressed challenges imposed by TEEs, including code signing, application re-compilation, manual re-partitioning, and dynamic module loading.

- **DiSCS Laboratory, FORTH-ICS** — **Heraklion, Greece**
  Undergraduate Research Fellow, Intel SGX, Android — *November 2016 – February 2019*
  - Ported Intel SGX framework to the x86 port of Android.
  - Enhanced Android Keystore and Secure Device Pairing with Intel SGX capabilities.
  - Offered an embeddable API for integrating Intel SGX into programs.
  - Provided a fully working toolchain cross-compiler compliant with Android and Intel SGX.

Publications

- **Practically Correct, Just-in-Time Shell Script Parallelization**
  Konstantinos Kallas, Tammam Mustafa, Jan Bielak, *Dimitris Karnikis*, Thurston HY Dang, Michael Greenberg, Nikos Vasilakis
  16th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2022)
- **The million dollar handshake: secure and attested communications in the cloud**
  N Chalkiadakis, D Deyannis, *D Karnikis*, G Vasiliadis, S Ioannidis
  2020 IEEE 13th International Conference on Cloud Computing (CLOUD), 63-70

- **Themis: A Secure Decentralized Framework for Microservice Interaction in Serverless Computing**
  A Aktypi, *D Karnikis*, N Vasilakis, K Rasmussen
  Proceedings of the 17th International Conference on Availability, Reliability and Security
- **Andromeda: Enabling Secure Enclaves For The Android Ecosystem**
  Dimitris Deyannis, *Dimitris Karnikis*, Giorgos Vasiliadis, Sotiris Ioannidis
  4th Information Security Conference (ISC 2021)
- **An Enclave Assisted Snapshot-based Kernel Integrity Monitor**
  Dimitris Deyannis, *Dimitris Karnikis*, Giorgos Vasiliadis, Sotiris Ioannidis
  Proceedings of the 3rd ACM International Workshop on Edge Systems, Analytics and Networking 2020

Education

University of Crete, Greece
Master of Science (MSc) in Computer Science — *February 2019 – February 2021*

University of Crete, Greece
Bachelor of Science (BSc) in Computer Science — *September 2013 – November 2018*

Advanced Technical Skills

- **Programming Languages:** C, C++, Lua, JavaScript, Python, Java
- **Development Tools:** Git, Docker, GitHub Actions, Protobuf, Yocto, D-Bus, CMake, Bash, Unix Tools, GDB, Latex, Qemu, Wireshark, Jira, Love2D
- **Systems:** Linux, Zephyr OS, Embedded Devices, Android AOSP
- **Other:** Bluetooth, GATT, Intel SGX, Arm TrustZone, Socket Programming, Concurrent Programming, UWB, Cross-Compiling, PostgreSQL, REST