

Bojan Novković

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Education

UNIVERSITY OF ZAGREB, FACULTY OF ELECTRICAL ENGINEERING AND COMPUTING

PH.D. - COMPUTER SCIENCE

📅 Ongoing

📍 Zagreb, Croatia

Research areas: Operating systems, Compiler-assisted security, Systems security

Thesis: *Improving monolithic kernel security and robustness through kernel subsystem isolation*

- Researching architectural approaches that enables intra-kernel subsystem isolation in existing monolithic kernels.
- Expected October 2023.

M. SC. - COMPUTER SCIENCE

📅 July 2020

📍 Zagreb, Croatia

B. SC. - COMPUTING

📅 July 2018

📍 Zagreb, Croatia

Volunteering

OPEN SOURCE SOFTWARE DEVELOPMENT

THE FREEBSD PROJECT

📅 May 2022 -

Projects related to IPC mechanisms, kernel debuggers, hypervisors and virtual memory improvements.

- <https://wiki.freebsd.org/BojanNovkovic>

VOLUNTEER SYSTEM ADMINISTRATION

KSET - CLUB OF ELECTRICAL ENGINEERING STUDENTS

📅 Feb 2018 - July 2020

📍 Zagreb, Croatia

Created and maintained club networking infrastructure, administrated numerous enterprise-class servers running GNU/Linux, FreeBSD, and OpenBSD.

Skills

PROGRAMMING

C • C++ • Python • Rust • LLVM • Kernel development (FreeBSD, Linux) • Hypervisor development • Assembly (x86_64, ARM)

MISCELLANEOUS

Shell • ~~TeX~~ • Git • (GNU/BSD)Make • CMake • Idscripts • FreeBSD kernel and Linux kernel internals • Debuggers • Networking • Intel VT-x • AMD SVM

LANGUAGES

Croatian (native) • English (B2)

Links

🐙 GitHub **BojanoN, bnovkov**

🔑 Orcid **0000-0002-8414-7960**

🌐 LinkedIn, **Faculty home page**

Selected Projects

🐙 MUGO

A hobby x86 microkernel with its own LLVM-based toolchain.

🐙 DGUARD

An LLVM IR pass used as a research prototype to implement and test new *Data Flow Integrity* schemes.

Experience

GOOGLE SUMMER OF CODE - THE FREEBSD PROJECT

PHYSICAL MEMORY ANTI-FRAGMENTATION MECHANISMS

📅 May 2023 - in progress

Working on adding physical memory anti-fragmentation mechanisms to the virtual memory subsystem.

- <https://summerofcode.withgoogle.com/archive/2023/projects/DcDs0ZSS>

HYPERVISOR DEVELOPMENT

📅 May 2022 - Sep 2022

Added new virtual machine debugging functionalities to the bhyve hypervisor.

- <https://summerofcode.withgoogle.com/archive/2022/projects/XpcMpdul>

UNIVERSITY OF ZAGREB, FACULTY OF ELECTRICAL ENGINEERING AND COMPUTING

RESEARCHER

📅 Oct 2021 - Aug 2023

📍 Zagreb, Croatia

JUNIOR RESEARCHER

📅 Sep 2020 - Oct 2021

📍 Zagreb, Croatia

Researcher on an *ERDF*-funded project - *AIPD2, Digital platform for personal data lifecycle management protection*

- Worked with confidential computing technologies to increase database security

Teaching Assistant for following courses:

- *Operating systems*
- *Advanced operating systems*

SARTURA D.O.O.

C DEVELOPER

📅 May 2020 - Aug 2020

📍 Zagreb, Croatia

Developed *GNU/Linux* embedded networking solutions for ARM-based systems, worked on improving security through fuzzing system software, developed AF_XDP-based userspace networking products.

INFOGO IS D.O.O.

JUNIOR PENETRATION TESTER

📅 June 2018 - May 2020

📍 Zagreb, Croatia

Reverse engineering mobile applications on ARM architectures (iOS, Android), mobile and web application penetration testing.

Selected Publications

- Novković, Bojan. "bhyve debug server enhancements" AsiaBSDCon.2023.
- Novković, Bojan, and Marin Golub. "Improving monolithic kernel security and robustness through intra-kernel sandboxing." *Computers & Security* (2023): 103104.
- Novković, Bojan, and Marin Golub. "SoK: Secure Memory Allocation." *International Conference on Cryptology and Network Security*. Springer, Cham, 2021.