

Ognjen Glamocanin

COMPUTER SCIENCE PHD STUDENT

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Research Interests

I am a PhD student in Computer Science at EPFL, and my research interests include FPGAs (security, cloud integration, AI acceleration), hardware security, and machine learning applications. My current research focuses on cloud FPGA security and analyzing vulnerabilities introduced by multiple users sharing the same FPGA.

Education

EPFL, Ecole Polytechnique Fédérale de Lausanne

PHD IN COMPUTER SCIENCE

- Power side-channel security of shared FPGAs in the cloud
- Thesis advisors: Dr. Mirjana Stojilović and Prof. Babak Falsafi

Lausanne, Switzerland

Expected grad: August 2023

Sorbonne Université, Paris VI

M.S. IN COMPUTER SCIENCE

Paris, France

2017 – 2018

University of Novi Sad, Faculty of Technical Sciences

B.S. WITH HONOURS IN ELECTRICAL ENGINEERING

Novi Sad, Serbia

2013 – 2017

Work Experience

ARM

CPU MICROARCHITECTURE AND DESIGN INTERN

- Analyzed CPU microarchitectural events for the purposes of power consumption estimation during cycle accurate simulation
- Used ML techniques to model correlation between events and simulated layout-level power consumption
- Enabled power estimation in early microarchitecture design stages by integrating power prediction in a cycle-accurate simulator

Sophia Antipolis, France

Mar 2018 – Aug 2018

FROBAS D.O.O.

MACHINE LEARNING HARDWARE ACCELERATION INTERN

- Design and verification of an ML hardware accelerator for multi-layer perceptron (MLP) artificial neural networks (ANNs)

Novi Sad, Serbia

Nov 2016 – Jun 2017

ELSYS EASTERN EUROPE

HARDWARE FUNCTIONAL VERIFICATION INTERN

- Used SystemVerilog and the UVM methodology to build a functional verification environment for an OCP2UART bridge

Belgrade, Serbia

Jul 2016 – Oct 2016

Publications

RDS: FPGA Routing Delay Sensors for Effective Remote Power Analysis Attacks

(conditionally accepted)

DAVID SPIELMANN*, O. GLAMOČANIN*, M. STOJILOVIĆ (* EQUAL CONTRIBUTION)

- Novel FPGA-based voltage sensor architecture using routing resources.
- Evaluation showing superior sensing capabilities than the state of the art, even on datacenter accelerator cards (Alveo U200).

TCHES

2023

Temperature Impact on Remote Power Side-Channel Attacks on Shared FPGAs

O. GLAMOČANIN, H. BAZAZ, M. PAYER, M. STOJILOVIĆ

- Analysis of temperature impact on FPGA-voltage sensors and remote power-analysis attacks.
- Impact of temperature effects on ML-based power side-channel attacks.

DATE

2023

The Side-Channel Metrics Cheat Sheet

K. PAPAGIANNOPOULOS*, O. GLAMOČANIN*, M. AZOUAOUI*, D. ROS*, F. REGAZZONI*, M. STOJILOVIĆ* (* EQUAL CONTRIBUTION)

- Analysis and comparison of methods for power side-channel security evaluation, with extensive experimental examples.
- Work accompanied with an open-source library of metrics for side-channel analysis.

CSUR

2022

Improving First-Order Threshold Implementations of SKINNY

A. CAFORIO, D. COLLINS, O. GLAMOČANIN, AND S. BANIK

- An efficient threshold implementation protection against power side-channel attacks for the SKINNY cipher.
- Experimental evaluation showing no existence of first-order power side-channel leakage.

INDOCRYPT

2021

Shared FPGAs and the Holy Grail: Protections Against Side-Channel and Fault Attacks

DATE

O. GLAMOČANIN, D. G. MAHMOUD, F. REGAZZONI, AND M. STOJILLOVIĆ

2021

- Analysis of recently proposed methods for protection against side-channel and fault attacks in shared FPGAs.
- Insights on the versatility and inter-operability of the countermeasures, with an emphasis on future research directions.

Are Cloud FPGAs Really Vulnerable to Power-Analysis Attacks?

DATE

O. GLAMOČANIN, L. COULON, F. REGAZZONI, AND M. STOJILLOVIĆ

2020

- Implementation of an FPGA-based voltage sensor on the state-of-the-art cloud FPGAs: Xilinx UltraScale+ on AWS F1 instances.
- Demonstration that remote power side-channel attacks are possible on cloud-scale FPGAs, and pose a serious threat to FPGA multitenancy.

Built-In Self-Evaluation of First-Order Power Side-Channel Leakage for FPGAs

ISFPGA

O. GLAMOČANIN, L. COULON, F. REGAZZONI, AND M. STOJILLOVIĆ

2020

- Demonstration that FPGA-based voltage sensors can be used for remote power side-channel leakage estimation.
- Design of a first remote power side-channel leakage assessment system, allowing side-channel security reevaluation on deployed devices.

Honors & Awards

2018	EPFL EDIC Fellowship, Fellowship for first-year PhD students	Switzerland
2017	French Government Scholarship for International Students, Full scholarship for master studies in France	France
2016	Dr Vladan Desnica Award, Best student of the microcomputer electronics track	Serbia

Teaching Experience

EPFL

Lausanne, Switzerland

TEACHING ASSISTANT

Feb 2019 – ongoing

- **Computer Architecture:** Head TA, managing the course and lab sessions in CPU micro-architecture for 2nd year B.S. students
- **System Programming Project:** Leading lab sessions in C for 2nd year B.S. students
- **Information, Computation, Communication:** Head TA, managing the course and leading lab sessions in Python and C for 1st year B.S. students

University of Novi Sad

Novi Sad, Serbia

TEACHING ASSISTANT

Sep 2016 – Jun 2017

- **Electrical Circuit Theory:** Leading computer lab sessions in MATLAB for 2nd year B.S. students
- **Systems and Signals:** Leading computer lab sessions in MATLAB for 2nd year B.S. students

Technical Skills

Programming languages:	C/C++ (10yrs), Python (6yrs), SystemVerilog, MATLAB
Scripting languages:	Python, Bash, TCL
Hardware description languages:	VHDL (9yrs), Verilog, SystemC
CAD EDA tools:	Xilinx ISE, Xilinx Vivado and Vitis, Cadence NCSim

Languages

Serbian:	Mother tongue
English:	fluent (level C2)
French:	fluent (level C1)
German:	beginner (level A1)

Extracurricular Activities

The Illuminations of Jules Verne

Novi Sad, Serbia

FESTIVAL COORDINATOR

2012 – 2015

- Head coordinator of the music part of the festival of light, music and lanterns *The Illuminations of Jules Verne*
- Created and coordinated the music program, logistics
- <https://www.facebook.com/ZilvernoveskeIlluminacije/>