NIKOLA MIRKOVIC

+381 63 822 4773 | mn200418d@student.etf.bg.ac.rs

Education

School of Electrical Engineering, University of Belgrade | Belgrade, Serbia October 2020 - June 2026
Bachelor of Science in Electrical & Computer Engineering
GPA: 9.17/10 (last two years), 8.27/10 (cumulative)
Relevant coursework: *Quantum mechanics, Statistical physics, Solid state physical electronics, Quantum electronics, Physical electronics of gases and plasma, Laser technology, Microelectronics and nanoelectronics, Optical telecommunications, Electromagnetics, Semiconductor quantum nanostructures, Pattern recognition, Signals and systems*

Professional Experience

University of Belgrade | Belgrade, Serbia October 2022 - Present
Independent projects
- Developed and optimized algorithms for solving the optimal node addition problem in spanning trees using Differential Evolution and Genetic Algorithms, enabling general solutions for arbitrary 2D node configurations with an adjustable number of added nodes.
- Designed and prototyped a MEMS-based accelerometer with integrated pedometer functionality for motion detection and step counting applications.
- Programmed MATLAB simulations of particle collisions in a 3D ideal gas, employing Maxwell-Boltzmann statistics.
- Designed and fabricated optical sensors for liquid-level detection in petroleum barrels.
- Demonstration of light absorption and light scattering using smartphones and gradually diluted water ink, which lead to demonstrations of the experiment to the first-year students this school year.

Lawrence Livermore National Laboratory (LLNL) | Livermore, USA July 2025 - August 2025
Experimental Research Team, Fast Collisionless Shocks (Prof. Julien Fuchs' beamtime)
- Successfully generated shocks and associated very high-energy (>10MeV) accelerated protons using TITAN's ps-driver.
- Contributed to experimental setup of the vacuum chamber, optical probing, gas jet, perturbation beamlines, pulsed magnetic field generator (up to 50T), motor control systems.
- Designed, aligned, and optimized diagnostics including Thomson parabolas, electron and ion spectrometers based on FUJI's IP (image plate) technology, Streak cameras, Interferometry, RCFs (Radiochromic films) for proton energy spectra.
- Performed shock-wave data analysis using Neutrino software to extract plasma parameters from multi-detector datasets.

Laboratoire pour l'Utilisation des Lasers Intenses (LULI) | École Polytechnique, Paris, France March 2025 - July 2025
Internship, SPRINT Group (Prof. Julien Fuchs)
- Conducted experimental and theoretical research in high-energy-density and plasma physics with a focus on laboratory astrophysics.
- Analyzed data from prior beam campaigns and contributed to manuscript preparation with the SPRINT group.
- Assisted in ongoing experimental runs, supporting diagnostic setup and data interpretation.

Extreme Light Infrastructure - Nuclear Physics (ELI-NP) | Măgurele, Romania April 2025 - May 2025
Experimental Research Team, Dual Radiography Project (Itamar Cohen, CNRS beamtime)
- Enabled a novel dual (neutron and x-ray) interrogation method, based on ultra-intense lasers irradiating solid targets.
- Characterized the bright ~Mev-range X-rays produced by the multi-PW pulses irradiating thin solids, using partially transparent SiN targets, which correspond as well to an efficient source of high-energy protons.
- Optimized neutron production with high-Z targets (W, Au, Ta) while maintaining X-ray brightness and stability.
- Prepared the experiment by configuring neutron time of flight detectors, performing PIC simulations, RCF stack recipe calculations
- Supported shot execution, target fabrication, data collection, and preliminary analysis.

University of Belgrade | Belgrade, Serbia April 2023 - June 2023
Antenna Design Project (Prof. Miodrag Tasić)
- Designed and fabricated a CPW-Fed Super-Wideband Antenna with Modified Vertical Bow-Tie-Shaped Patch for Wireless Sensor Networks.
- Modeled architecture using Wipl-D Pro CAD and created a quadrangular model in Wipl-D Pro for performance optimization.
- Applied to pollution-detection applications across Serbian cities.

Other Activities

Čukalo Music Festival | Fruska Gora National Park, Serbia December 2022 – May 2025
Co-Founder, Head Organizer
- Created an independent two-day music festival (2023 and 2025) from scratch, in Fruska Gora National Park, with more than 300 people in attendance and 10 bands
- Lead team of 15 international volunteers
- Managed finance, marketing, music, art exhibit, catering, construction work and volunteers
- Čukalo 2025 had bands and artists spanning across Europe: https://cukalo.com/#hero

Oasis behind Boutazart Nait ounzar | Tagounite, Sahara, Morocco January 2024-March 2024
Intern/ volunteer
- Reconstructed traditional houses of the Berber people, destroyed after deserting the oasis due to climate change
- Restored wells and reconstructed the agriculture watering pools and irrigation systems

Skills

Software: Python, MATLAB, C, C++, Arduino, LabVIEW, Ansys Lumerical, Neutrino, CircuitMaker, ImageJ, nextnano
Language: English, Serbo-Croatian, Spanish (limited proficiency), French (in progress)
Citizenship: Serbia (SRB), Croatia (CRO)