

# NIKOLAOS CHATZIPAPAS

Geneva, Switzerland

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## SUMMARY

- 5 years of experience in electronics design, embedded systems and hardware engineering, with a portfolio of over 30 PCB designs, including designs installed in the CERN accelerator.
- Directed a team of over 20 engineers on an unmanned solar UAV project for forest fire detection.
- Saved over 100,000 CHF by designing a low-cost analog PCB, increasing cards reliability by 20%.
- Among 15 ethical hackers selected globally, tampered latest car environmental protection systems.
- Master's in Electrical Engineering & Computer Science, graduated with 8.71/10 GPA, top 4%.

## PROFESSIONAL EXPERIENCE

### European Council for Nuclear Research (CERN)

Geneva, Switzerland

*World's leading particle physics laboratory, researching the fundamental structure of the universe. It operates the Large Hadron Collider (LHC), with over 10,000 researchers, 2,500 staff and has an annual budget exceeding 1 billion CHF.*

#### Electronics Engineer

09/2022 – Present

- Led the design of radiation-tolerant electronics for High-Luminosity LHC projects.
- Developed and prototyped new WorldFIP communication cards, the most critical card in cryogenic crates. Implemented Wishbone FSM in VHDL for data exchange between two FPGAs.
- Delivered savings exceeding 100K CHF by designing a low-cost analog PCB using only transistors, resistors, diodes and capacitors, replacing FPGA-based solution. Led to 20% reliability increase.
- Supervised a master's student on a daily basis for six months, on preliminary design of analog card based on 4-20 mA loop. One year supervision of apprentice on soldering and testing tasks.
- Coordinated electronics projects for two CERN graduates, including Wien bridge oscillator design.
- Designed and prototyped new radiation tolerant digital cards for cryogenic valves control.
- Directed two radiation campaigns at CHARM, using an automated MATLAB tester to evaluate the impact of radiation on transistors, MOSFETs, operational amplifiers, and voltage regulators.
- Performed accelerated life testing of ICs, reducing lifespan by 50% for every 10°C increase.
- Designed high-voltage card protection circuit, up to 2.1 kV, using thyristor surge suppressors.
- Reduced inventory working time by 60-80% by developing Python automation tools.
- Engineered radiation-tolerant 3D printed piezo valve cases using ULTEM and Accura25 materials.

### Aristotle Space and Aeronautics Team (ASAT)

Thessaloniki, Greece

*The largest and most prestigious aerospace student team in Greece. ASAT conducts research through two departments: Aeronautics and Rocketry, with 51 active members and ranks among the top 10 student teams in Europe.*

#### Systems Engineer

01/2022 – 06/2022

- Coordinated more than 20 engineers on an unmanned solar UAV project for forest fire detection.
- Applied NASA's systems engineering methodology, and STPA analysis for risk management.

## Coordinator of Solar Energy Management team Solar Engineer

09/2020 – 01/2022  
03/2020 – 09/2020

- Supervised 4 electronics engineers on technical tasks. Interviewed over 30 applicants.
- Engineered flexible solar cells, high-density rechargeable batteries, charging circuits such as Maximum Power Point Tracker integrated with embedded fuzzy logic, using microcontroller boards.
- Performed simulations of charging circuits, using Matlab/Simulink.
- Directed Arduino webinar with over 300 live participants. Co-presented PCB design workshop.

## Democritus Industrial Robotics (DIR)

Xanthi, Greece

*Leading research group specializing in industrial robotics innovation, competing in RoboCup and RoboIndustrial League.*

## Computer Vision Engineer

03/2021 – 07/2021

- Implemented cavity detection in Python, using high-end camera on robotic arm for RoboCup 2021.

## EDUCATION

### Democritus University of Thrace 5 years

Xanthi, Greece

Master's & Bachelor's, 5-year degree in Electrical Engineering & Computer Science

- Grade: 8.71/10, Excellent, top 4%, 65 courses, 300 ECTS.
- Thesis: Experimental DC motor control using microcontroller embedded artificial intelligence.

*Laboratory experience in incremental encoders, DAC's and ADC's, oscilloscope. Embedded software using Artificial Intelligence algorithms in Arduino and STM32 boards. Simulations of my hardware in Simulink.*

## DISTINCTIONS

### Battery 2030 Young Scientist Event June 2022

Brussels, Belgium

- Submitted proposals for the future of European battery research and co-signed the manifesto.

### DIAS Hack a Truck part 2 Apr 2022

Rotterdam, Netherlands

- Physical hacking event, hosted by TNO, Bosch, Ford, and FEV. Tampered the latest developed car environmental protection systems.
- 15 selected hackers worldwide, formed 4 teams. My team was 1 of 2 that successfully hacked a testbed by performing MITM attacks on CAN-bus and Autosar SecOC on Raspberry Pi testbeds.

### DIAS Hack a Truck part 1 May 2021

Online event

- 20 ethical hackers selected. Identified a vulnerability in EU6 regulations that garnered recognition from industry experts.

## PUBLICATIONS | SKILLS | INTERESTS

- Interval Type-2 Fuzzy Logic Controller Development for Coreless DC Micromotor Speed Control Applications, *ICCCES 2022*.
- Implementation of current and ventilation control for enhanced TEC performance, *PACET 2019*.

### Engineering

PCB design, digital and analog electronics, power electronics, FPGA, microcontrollers, embedded AI, closed-loop control (PID, fuzzy), instrument control, 3D printing.

### Coding

C, C++, Python, VHDL, System Verilog, LaTeX.

### Software

Altium, Matlab, ANSYS, Quartus, PyCharm, Linux.

### Interests

Football: played semi-professionally for 5 years, plants.