Diego Belusky

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Summary

Motivated electrical engineering graduate with expertise in control systems, model-based design, optics, photonics, and software development. Proficient in MATLAB/Simulink, C++, Python, and data analysis, with experience in robotics, automation, THz-TDS for ceramic analysis, and quantum photonics experiments involving 2D materials. Adept at translating simulations into practical solutions, integrating hardware, and implementing algorithms for real-world applications while seeking opportunities to contribute in optical engineering, control systems, or software development.

Education

Zurich University of Applied Sciences (ZHAW) *Sept 2021 – Jul 2024*
Bachelor in Electrical Engineering

- Focus: Optics, Photonics, Control Engineering and Wireless Communication
- Bachelor Thesis: Production and Optical Analysis of 2D Materials for Quantum Photonics Experiments
  - Developed $MoSe_2$ monolayers using tape exfoliation.
  - Conducted photoluminescence spectroscopy and automated reflectivity measurements using custom-built optical systems.
  - Explored applications for optical microcavities to study advanced light-matter interactions.

Kantonsschule Zürich Nord *Sept 2016 – Jul 2020*
Fachmittelschule with Fachmaturität

- Profile: Natural Sciences
- Fachmatura: Project to improve the industrial thawing process of fish

Experience

Project Lead Intern – Process Optimization *Zurich, Switzerland*
Micarna Seafood *Nov 2019 – Apr 2020*

- Conducted experiments and data analysis to improve industrial defrosting processes.
- Increase of 2.2% in yield and increase in quality for food safety standards.
- Collaborated with teams to implement more efficient workflows.

Electrical Intern *Dällikon, Switzerland*
Kummler+Matter AG *May 2021 – Aug 2021*

- Gained hands-on experience in electrical installations and troubleshooting.

Military Service – Panzer Grenadier *Thun, Switzerland*
Swiss Armed Forces *Jul 2024 – Nov 2024*

- Completed 4.5 months of training and service as mechanized infantry.
- Developed skills in teamwork, leadership, and strategic problem-solving under challenging conditions.

Projects

Production and Optical Analysis of 2D Materials for Quantum Photonics Experiments

- Fabricated monolayers of $MoSe_2$ using mechanical exfoliation techniques and optimized processes for enhanced yield and quality.
- Designed and built a custom micro-photoluminescence spectroscopy system with automated scanning capabilities and characterized excitonic properties through photoluminescence spectroscopy to analyze optical properties of 2D materials.
- Investigated potential for planar optical microcavities to study polarons and quantum effects.

Quality Testing of Advanced Ceramics Using THz-TDS

- Conducted material characterization using Terahertz Time-Domain Spectroscopy (THz-TDS).
- Analyzed dielectric properties (e.g., refractive index, absorption) of advanced ceramics such as aluminum oxide (Al_2O_3), low-temperature co-fired ceramics (LTCC), and aluminum nitride (AlN).
- Developed non-contact measurement techniques for thickness and defect identification.

Thermal Simulation of Floor Heating Systems (Industry Collaboration)

- Conducted finite element modeling to analyze heat transfer in underfloor heating using NGSolve in Python.
- Implemented Stokes and heat equations with realistic boundary conditions to evaluate thermal distributions.
- Simulated time-dependent temperature evolution, integrating variable material properties and geometrical parameters.

Technical Skills

Programming & Software:

- MATLAB/Simulink: Data analysis, signal processing, controller design.
- Python: Automation, numerical mathematics, computer simulation, image processing (OpenCV).
- C/C++: Microcontroller programming, robotics, and controller development.
- Swift/SwiftUI: iOS app development.
- VHDL/Intel Quartus: FPGA programming.
- HTML & Java: Web and software application development.

Engineering Tools:

- Eagle: PCB design.
- LTSpice: Circuit simulation.
- Wireshark: Network analysis and diagnostics.
- Siemens TIA Portal (ST): Production automation.

Languages

- German: Native
- English: Advanced (C1)

Hobbies & Interests

- Hockey: Active player at Academic Ice Hockey Club Zurich (AECZ).
- Music Production: Experience with DAWs for digital composition.
- Fitness & Outdoor Activities: Passionate about strength training and team sports.