imperix

FALL–WINTER 2026–2027

STUDENT PROJECT PROPOSALS

COMPUTER SOFTWARE PROJECTS (C++)

SOFTWARE-BASED POWER ANALYZER

Motivations: Imperix is developing system identification capabilities for the Cockpit software, enabling the measurement of transfer functions or impedances for various systems. The module, however, suffers from a few limitations. An improved version is planned, leveraging more advanced signal processing inside the FPGA.

Objectives: Implement the FPGA-based functions required by the impedance analyzer, such as digital signal synthesis (DDS), demodulators (lock-in amplifier stage), and multiple filters. Update the Cockpit module's implementation and user interface accordingly. Implement software support for open/short/load calibration. Run a full validation and qualification campaign in the laboratory.

Skills: A good command of C++ and a solid background in digital signal processing are required. Prior experience with FPGA design is also essential.

AUTOMATED FEATURE EXTRACTION FOR A SOFTWARE OSCILLOSCOPE

Motivations: Evaluating control performance manually from oscilloscope traces is a time-consuming and subjective process. Automating the extraction of key metrics, such as overshoot, settling time, frequency peaks, duty-cycles, etc. from the available waveforms can streamline the performance review and eventually contribute to automated control tuning techniques.

Objectives: Review and implement multiple algorithms for automatically extracting performance metrics from the available time and frequency data inside Cockpit.

Skills: General knowledge in signal processing is recommended. This project is also available to BSc-level students.

HIGH-PERFORMANCE PLOTTING LIBRARY FOR A REAL-TIME MONITORING SYSTEM

Motivations: We want to modernize the backend of our power electronics monitoring software by investigating different plotting libraries regarding performance, visualization capabilities, and flexibility compared to our current solution.

Objectives: Understand the current way signals are displayed in the context of user requirements, performance limitations, and the program's software architecture. Evaluate the opportunities provided by the different libraries and how they could integrate into our application.

Skills: Previous experience with C++ and software development is required. Familiarity with computer graphics and rendering is a plus.

AUTONOMOUS TEST GENERATION VIA AGENTIC LLM WORKFLOWS

Motivations: As our power electronics monitoring software scales, ensuring the reliability of our core Qt C++ codebase is critical. Leveraging emerging AI agent workflows offers a promising avenue for generating automated tests and increasing our test coverage.

Objectives: Evaluate, design, and implement an agentic LLM workflow (e.g., using LangChain, AutoGen, or similar frameworks) capable of parsing our existing C++ codebase and autonomously generating unit and integration tests. Assess the limitations of AI in understanding our codebase and producing meaningful, reliable tests.

Skills: Experience with C++ and object-oriented programming, along with a strong interest in Large Language Models and agentic frameworks is expected. Familiarity with software testing paradigms is a plus.

VISION-LANGUAGE AGENTS FOR AUTOMATED DESKTOP UI TESTING

Motivations: The advent of Vision-Language Models (VLMs) opens the door to "visual" software agents that can autonomously test graphical interfaces like a human would: by looking at the screen.

Objectives: Research and implement a proof-of-concept multimodal AI agent capable of interacting with and testing our Qt-based Windows desktop program. Utilize VLMs to interpret UI states and autonomously navigate the application to ensure critical user workflows function correctly.

Skills: Strong programming skills (C++ or Python) are required. A background in Machine Learning, particularly with multimodal models, computer vision, or LLMs, is expected. Experience with Qt or UI/UX paradigms is a plus.

AUTOMATED CODE GENERATION BASED ON OPEN-SOURCE SIMULATION SOFTWARE

Motivations: Some universities are now evaluating alternatives to Mathworks (Matlab, Simulink), notably due to the high cost of their products. This raises interest in supporting automated code generation from open-source alternatives, such as SciLab+Xcos.

Objectives: Develop, implement, and test an extension of the imperix ACG SDK to support code generation from SciLab+Xcos

Skills: Familiarity with Simulink Coder is a plus. An interest in open-source solutions is a plus.

YOUR PROFILE

An internship with us will suit you if:

- You are a PhD, MSc, or BSc student.
- You are looking for a 3-to-9 months on-site internship in Sion, Switzerland.
- You are seeking to work in a dynamic, fast-paced environment.
- You are self-motivated and capable of working both individually and as part of a team.
- You expect attentive supervision of your work from highly qualified engineers.
- You are looking for a position that values and makes room for your initiatives.
- You appreciate a young and friendly environment that is also serious and professional.

If you are interested in doing an internship with us, please send your CV along with a cover letter explaining your motivations and what you would bring to the team. Email correspondence should be addressed to jobs@imperix.ch. We reserve the right to maintain correspondence only with profiles that reasonably match the position requirements.

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ABOUT US

Imperix is a leading global provider of high-performance control solutions and rapid prototyping hardware engineered specifically for power electronics. Founded in 2013 as a spin-off from the Swiss Federal Institute of Technology (EPFL), the company accelerates innovation by bridging the gap between numerical simulation and physical implementation.

At the core of the Imperix ecosystem is the flagship B-Box controller family, which unites robust digital processing, the intuitive Cockpit software, and automated code generation from Simulink and PLECS. These control development solutions are complemented by a comprehensive hardware portfolio encompassing modular power stages, high-fidelity sensors, fully integrated inverters, as well as hardware and software interfaces for real-time HIL/PHIL simulation. Together, these tools empower top-tier industrial and academic R&D teams to safely test advanced control algorithms on real hardware within minutes, drastically reducing time-to-market and time-to-publication.

Headquartered in Sion, Switzerland, Imperix serves a prestigious client base across more than 50 countries. By delivering specialized, modular tools for power conversion, smart grids, motor drives, electric mobility, and energy storage, Imperix stands at the forefront of the technology enabling the global energy transition.