TU Graz

Open Thesis / Project:

Next-Generation Embedded Platforms for Battery Transportation Safety

Motivation & Summary

The battery is the backbone of electric vehicles, comprising hundreds to thousands of cells. Achieving climate neutrality in mobility necessitates large-scale battery production, which in turn demands efficient, safe transportation and storage. As dangerous goods (Class 9), battery cells require meticulous handling and continuous monitoring of their State-of-Health. In collaboration with **Lokistix**—a pioneer in intelligent logistics solutions—this thesis/project tackles the multifaceted challenges of battery cell logistics.

Recommended Prior Knowledge

- Embedded Systems and Firmware Development (e.g., C, MicroPython)
- Communication Protocols and Sensor Networks (e.g., BLE, WiFi, LTE)
- Industrial Interface Standards (e.g., OPC UA)
- PCB Design and Prototyping

Thesis Type

- Master's Thesis
- Master's Project

Student Target Groups

- Computer Science (CS)
- Information and Computer Engineering (ICE)
- Electrical Engineering (EE)

Goals & Tasks

- **Sensor Data Acquisition:** Develop firmware with advanced condition monitoring.
- **System Interface:** Implement an interface for data exchange with production/logistics systems.
- **Robust Communication:** Enable reliable multi-protocol connectivity (field to edge to cloud).
- **Hardware Integration:** Design an efficient embedded system for scalable quality control.

Contact & Information

Dr. Tobias Scheipel (tobias.scheipel@tugraz.at)
Dr. Markus Schuß (markus.schuss@tugraz.at)
Assoc.Prof. Dr. Carlo Alberto Boano (cboano@tugraz.at)
Dipl.-Ing. David Reiter (david.reiter@lokistix.com)

Institute of Technical Informatics
Embedded Architectures & Systems Group

Lokistix GmbH