

Master's thesis (30 ECTS)

Working title: Online Gas Sensor Data Analysis on Red Pitaya

In cooperation with: Materials Center Leoben Forschung GmbH



Materials Center Leoben Forschung GmbH (MCL) is an internationally active research institution specializing in materials research along the whole product value chain starting from the materials synthesis, proceeding with the processing of products and concluding with their in-service behavior until the end of the product life time. MCL is carrying out long-term research and development projects in cooperation with a total of some 150 industrial and scientific partners as well as laboratory, computational and advisory services.

MOS gas sensor technology is a hot research topic pursued at MCL, including in-house fabrication of nano materials and their CMOS-process integration. Julia is a new programming language aiming at scalable technical computing. Potentially, the same code might be deployed on clusters, desktop computers and embedded devices.

Tasks:

- Learning about latest MOS gas sensor technology
- Understanding measurement setup and existing data sets
- Process existing data sets with selected data mining algorithms
- Document execution time on multi-core desktop & embedded platforms (Red Pitaya)
- Identify major implementation bottlenecks
- Provide improved implementations where possible
- Explore HTML5-based reporting (e.g. Gadfly SVGJS)
- Select one algorithm for integration in outdoor gas analysis setup

Requirements:

- Education: TU Technical Physics, Technical Chemistry, Telematics, Electrical Engineering
- Expert knowledge: Lecture and documented interest in data mining Proven programming skills in Python or similar
- Nice-to-have: Interest in parallel programming, embedded computing, Linux, Julia

Additional information:

- Supervisor TU Graz: Prof. Alexander Bergmann; Supervisors MCL: Dr. Anton Köck, Dr. Manfred Mücke
- Expense allowance: € 3.000,00 netto for 6 months
- Period: 6 months
- Start of work: as soon as possible
- Graz & Leoben
- Employment

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