

CAN I COMBINE SCIENCE AND BUSINESS IN A SINGLE JOB?

YES.

We'll show you how at Fraunhofer IIS.

For the »**Self-Powered Radio Systems**« department in **Nürnberg**, the Fraunhofer Institute for Integrated Circuits IIS is currently seeking a

Intern / Bachelor Thesis Student

Analysing Energy Consumption for Sigfox LPWAN

The department of »**Self-Powered Radio Systems**« is focused on efficient systems and protocols for wireless data transmission and energy harvesting. One priority is the area of Internet of Things (IoT) and Industrial Internet of Things (IIoT), which led to the development and ongoing improvements of **Mioty**, a new **low-power wide-area network** (LPWAN) technology. Mioty, an ETSI standardised system, is analysed, among other features, with respect to energy efficiency, and compared to other LPWAN technologies, e.g. NB-IoT (3GPP).

Energy consumption of the end devices is a major concern for LPWAN systems. Sigfox is a major representative of LPWANs (among Lora, NB-IoT, Mioty). The impact of system parameters, e.g. payload length and sleep current, should be measured and analysed for one end-device implementation (Arduino MKRFOX1200). The analysis should lead to an energy consumption model for Sigfox systems. The model has to be tested for one typical LPWAN use case and compared with measurements.

Your tasks

- You familiarise with Sigfox system, especially with system parameters impacting current consumption
- You set up a Sigfox communication link (end-device - base station)
- You run automated current consumption tests of the end-device, depending on the major system parameters
- You analyse the test results
- You extract system parameters impact on current consumption into a prediction model
- You test energy predictions for one typical LPWAN use case and verify with use case measurement

Your profile

- You are studying electrical/electronic engineering
- You have good knowledge with Python
- You are experienced with an object oriented programming language
- You are familiar with digital signal processing (nice to have)

What you can expect from us

- An **open and cooperative** working environment
- Collaboration in interesting and **innovative projects**
- Many opportunities to gain practical experience and attend seminars
- **Flexibility** concerning your working hours

If you have any questions about this opening, please contact **wolfram.strauss@iis.fraunhofer.de**

Interested?

Please apply for this position using the following link: <https://recruiting.fraunhofer.de/Vacancies/61903/Description/2>
Applications are possible **in German and English**. Please include a cover letter, your CV and your latest transcripts of records (as PDF) and quote ID number **61903-LV**. Address your application to Nina Wörlein.

Please let us know how you learned about this job opportunity.

Additional information is available on our website: www.iis.fraunhofer.de/en