



MASTER'S THESIS ASSIGNMENT

I. Personal and study details

Student's name: **Hruška Ondřej** Personal ID number: **420010**
Faculty / Institute: **Faculty of Electrical Engineering**
Department / Institute: **Department of Measurement**
Study program: **Cybernetics and Robotics**
Branch of study: **Sensors and Instrumentation**

II. Master's thesis details

Master's thesis title in English:

Learning and Automation GPIO Platform

Master's thesis title in Czech:

Výuková a automatizační GPIO platforma

Guidelines:

Design and implement a modular system consisting of a motherboard and additional modules for connecting sensors, actuators and general inputs via I2C, SPI, UART, 1-Wire or other interfaces to the central system via USB, UART, and wireless interfaces. Allow access to built-in processor peripherals such as ADC, DAC, and timers (PWM, frequency measurement). Design a comfortable way to set the configuration without firmware changes. For the designed system, create a service library in C, Python, and MATLAB.

Bibliography / sources:

- [1] STMicroelectronics datasheets, <http://www.st.com>
- [2] Ganssle, J.: The Art of Designing Embedded Systems, Elsevier Science, 2008.
- [3] Chi, Qingping & Yan, Hairong & Zhang, Chuan & Pang, Zhibo & Da Xu, Li. (2014).: A Reconfigurable Smart Sensor Interface for Industrial WSN in IoT Environment. Industrial Informatics, IEEE Transactions on. 10. 1417-1425. 10.1109/TII.2014.2306798.

Name and workplace of master's thesis supervisor:

doc. Ing. Radislav Šmíd, Ph.D., Department of Measurement, FEL

Name and workplace of second master's thesis supervisor or consultant:

Date of master's thesis assignment: **10.01.2018** Deadline for master's thesis submission: _____

Assignment valid until:
by the end of summer semester 2018/2019

doc. Ing. Radislav Šmíd, Ph.D.
Supervisor's signature

Head of department's signature

prof. Ing. Pavel Ripka, CSc.
Dean's signature

III. Assignment receipt

The student acknowledges that the master's thesis is an individual work. The student must produce his thesis without the assistance of others, with the exception of provided consultations. Within the master's thesis, the author must state the names of consultants and include a list of references.

Date of assignment receipt

Student's signature