The University of Potsdam MATLAB/LEGO MINDSTORMS Environmental Remote Sensing Lab

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The MATLAB/LEGO MINDSTORMS Environmental Remote Sensing Lab for undergraduate and graduate students aims to improve their skills to solve typical problems in earth sciences. Topics include the acquisition, processing and analysis of typical multispectral (visible, infrared, thermal), geophysical (magnetic, seismic) and geometric (2D, 3D) data. Using the computer-controlled electromechanical parts of LEGO® MINDSTORMS® and the matching MATLAB Support Package, students design, build and program earth science data acquisition systems. Examples are multi- and hyperspectral satellites and acquisition systems for the analysis of geometric and structural design. In addition to the LEGO MINDSTORMS motors and sensors, there are a number of low-priced but high-quality sensors available in the lab, which are in some cases equipped with LEGO-compatible mounting systems. During the course, students will be familiarized with various aspects of data acquisition (sensors and their specs, such as bit depth, sampling rate, accuracy), data transfer (USB, Wifi, Bluetooth), code optimization and visualization of the acquired data in 2D and 3D. The didactic highlight of the course is the consistent use of modern teaching approaches, such as flipped classroom and constructionist learning concepts.