

Demonstration of micro: bit solutions for Fischertechnik robots to end users through workshops and lectures

Within the project "**Didacta advance - demonstration activities to improve the micro:bit solution**" implemented by the company Didacta advance d.o.o. Four demonstration workshops and lectures on the use of micro: bit and interfaces with Fischertechnik elements were held at four locations in Croatia: Zagreb, Split, Rijeka, Osijek.

Demonstration workshops were attended by teachers, professors and educators from primary and secondary schools, colleges and technical associations. During the demonstrations, the possibilities of using micro: bit and the interface with Fischertechnik elements were presented. Demonstration workshops (Split, Rijeka, Osijek) were conducted by doc.dr.sc. Ana Sović Kržić from the University of Zagreb, Faculty of Electrical Engineering and Computing with the help of Mr. Želimir Bistrović (Zagreb) from the applicant company Didacta advance d.o.o.

DEMONSTRATION WORKSHOPS

The first demonstration workshop was held on January 18, 2020 in Zagreb at the Faculty of Electrical Engineering and Computing (FER). The workshop was attended by 9 teachers from Zagreb, Križevac, Luka, Rijeka, Slavonski Brod and Gospić. The workshop demonstrated all models of the micro: bit - Fischertechnik interface, and their connection into simple robots: automatic ramp, traffic light, hand dryer and mobile robots. Teachers, in addition to getting acquainted with the new interface, asked questions and recommendations about the use of this product.



The second workshop was held on January 28, 2020 in Split at the Faculty of Science, University of Split, in the premises of the Inovatic Association. The workshop was attended by 9 participants from Split, Dugopolje and Kaštel Gomilica, from several primary schools, secondary Technical School of Mechanical Engineering and Mechatronics Split, the Association of Technical Culture of Split, PMF and the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture in Split and robotics associations. The workshop showed in an interactive way how to connect sensors and actuators (motors and LEDs) from the Fischertechnik set with micro: bit using the Interface. Micro: bit programming was demonstrated live, to which LED elements, a button and motors were connected. Examples were also demonstrated of how it is possible to create different robotic models using the above basic elements and thus combine creativity, construction, electrical engineering and computing, which encouraged teachers to discuss possible applications in teaching.



The third workshop was held on February 8, 2020 in Rijeka in the premises of the Youth Center. The workshop was attended by 8 primary school teachers from Rijeka, Čavle, Kraljevica and Pazin, the Youth Center Rijeka and the Technical Faculty of the University of Rijeka. After an interactive demonstration of connecting electronic elements to the micro: bit interface and programming in Blocks and Python programming languages, the workshop participants were shown models that can be assembled in class. The traffic light model can be used to learn the basics of circuits and used in the Young Technicians competition, Automation category. A mobile robot that is quite compact using this interface can be used in the competition in the category Robotic victim rescue. Three types of mobile robots are shown: a light source monitor that rotates if it collides with a wall, and a robot that follows a black line or avoids walls using an ultrasonic sensor. At the end of the workshop, feedback was collected from the gathered teachers.



The fourth demonstration workshop was held on February 13, 2020 in Osijek in the premises of the House of Technology. The workshop was attended by 13 primary and secondary school teachers from Osijek, the Robotic Club Osijek, the Association of Technical Culture of the City of Osijek and the Association of Technical Culture of Osijek-Baranja County. After the introductory presentation of the Interface and its parts, an LED was connected to the Interface and the Blocks programming language demonstrated how to create a program that will turn the LED on and off every second. The same program is, but slower on and off, demonstrated by programming in the Python programming language. The addition of the buttons demonstrates the use of the sensor and how the LED turns on and off by pressing it. The motors can be controlled by digital and analog values making it possible

control the speed and direction of the robot. During the workshop, one vehicle was programmed to move independently around the room. Other robots and learning models were also demonstrated. At the end of the workshop, participants were able to test and further view the presented models and robots. At the end of the workshop, the gathered teachers expressed their satisfaction with the convenience of the demonstrated products and the possibilities of the interface that enables quick and easy connection.



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