E-eksperimenti – Moderno poučevanje naravoslovja in tehnike z uporabo fleksibilnega merilnega sistema z odprtokodnim programjem

E-experiments – Modern Science and Technology teaching with the use of a flexible measurement system with Open Source software

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Povzetek: Na delavnici bomo predstavili projekt E-eksperimenti, namenjen nadgraditvi pouka naravoslovja in tehnike na srednjih (in delno tudi osnovnih) šolah s spletno platformo, ki omogoča izvajanje realnih eksperimentov. Spletna merilna platforma omogoča izvajanje realnih eksperimentov prek spletnih aplikacij z uporabo zmogljive merilne kartice in senzorjev. Eksperimenti tako lahko služijo kot e-storitev v demonstracijske in izobraževalne namene. Aplikacije omogočajo kreativno izvajanje eksperimentov, ki jih uporabniki lahko tudi sami spreminjajo in nadgrajujejo. Osnovne aplikacije podpirajo uporabo naprave kot osciloskopa, generatorja električnih signalov poljubnih oblik ter kot merilnika napetosti in toka. V okviru projekta nameravamo izdelati še dodatne aplikacije z različnimi senzorji, kar bo omogočalo merjenje pospeškov, svetlobnega toka, temperature, pritiska itd. S tem bomo zajeli velik del vsebin naravoslovnih predmetov v osnovnih in srednjih šolah. Vse aplikacije bo mogoče izvajati na različnih operacijskih sistemih (Windows, Linux, iOS, Android), saj bo uporabnik za izvajanje potreboval le spletni brskalnik. Merilno platformo lahko uporabljamo neposredno na mestu izvajanja eksperimenta, pa tudi kot eksperiment na daljavo. Projekt eEksperimenti bo tako obogatil in nadgradil načine poučevanja naravoslovja in tehnike ter dodatno motiviral učence za ti dve področji.

Abstract: The project E-experiments will be presented at the workshop. The main goal of the project is to supplement and upgrade Science and Technology lessons in secondary schools (and partly also in primary schools) with a Web-based platform for performing real experiments. Web-based measuring platform enables performing physical experiments through Web applications, using high-performance measurement (DAQ) card and attached sensors. The experiments can be used as an e-service for demonstrations and educational purposes. Applications enable creative usage of the experiments, as the experiments can be adapted and upgraded by the users. The basic applications use the device as an oscilloscope, as a generator of arbitrary shaped electrical signals, or as a measuring tool for electrical current and voltage. Within the project we plan to develop applications for usage of different sensors which will assist in measuring

acceleration, luminosity, temperature, pressure, etc. Thus we will cover the content of majority Science courses in primary and secondary schools. All applications can be performed on different operating systems (Windows, Linux, iOS, Android) as the user needs only a Web browser for running the experiments. The measuring platform can be used directly on the spot or as an remote experiment. E-experiments will certainly enrich and enhance approaches to teaching Science and Technology, consequently additionally motivating students for these areas.