

Ulyxes is an open source project to drive robotic total stations as well as other sensors, collect their measurements in database and finally publish the results for authorized users on the web. On special requests the results are also presented with web based maps in the background. This project is like an instant coffee: three in one (coffee, sugar and milk). The coffee and the strongest part is the research and coding. The sugar is the application of the program in industrial environment and the milk on the top is the educational usage. The software development started in 2008 connected to a monitoring task in the Hungarian Nuclear Power Plant. Since then the development has been extended from total stations to different positioning capable sensors. In 2012 the development of a new Python based object oriented framework started. The code is based on the results of some other open source projects, Python, PySerial, GNUGama, SQLite, OpenCV, etc. After connecting to the international Geo4All network in 2014, Ulyxes became a project of our Geo4All Lab. The project has its own home page (http://www.agt.bme.hu/ulyxes) and the source code is available on the GitHub portal (https://github.com/zsiki/ulyxes). The code is maintained by the colleagues at the Department of Geodesy and Surveying at the Budapest University of Technology, volunteers from all over the World are welcome. BSc and MSc students are also involved in the development and testing. More theses were connected to this project in the recent five years. In the curriculum of an MSc subject called Surveying Automation, Ulyxes is used to demonstrate automatized tasks in engineering surveying. The system has been applied for several projects during the last 10+ years. Typical applications are the load tests of bridges and other engineering structures and on the other hand Ulyxes can be used to monitor the movements of buildings in the nearby of constructional works, like metro stations, underground garage and other buildings as well. Raspberry Pi small, single board computers are used with Raspbian operating system during on-site works. The source code is divided into three parts. The first one is the Ulyxes API which is the core of the system. The second one, Ulyxes Apps is a collection of applications based upon the API. Some of them were developed by our students. The third part is the server side scripts to publish observation results through the Internet.

Sensor object model



Detailed object model



UML sequence diagram



Application areas

Deformation analysis





Test load of bridges and overpasses



Used open source					
projects	Tes				
Python2, Python3	Leic				
PySerial, PyBluez	Leic				
OpenCV	Leic				
PHP	Leic				
PostgreSQL/PostGIS	Trim				
MapServer	Тор				
JavaScript	Gar				

sted sensors

ca TCA1800 + GeoCom ca TCRP1201 + GeoCom ca TCRA1103 + GeoCom ca DNA03 nble 5503DR Con HiperPro II rmin GPS18





Demos

OpenLayers jQuery/jQuery-ui

Leica GPS 500 USB web camera, PI camera **BMP-180** LSM9DS0

Building monitoring







Source code on GitHub https://github.com/zsiki/ulyxes

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Home page of the project http://www.geod.bme.hu/ulyxes



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E pyapi Removed			15 days ago
bug fixing for new xml parsing			17 days ago
initial upload of robot project			5 years ago
erver querying relative coodinates added			last year
tclapi change output format for the first record			5 years ago
igitignore It works (maybe)			last year
LICENSE Initial commit			5 years ago
README.md Update README.md			last month
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 PyAPI TcIAPI Installation mos OpenLayers & OSM 	to create a framework to drive robotic total stations from a computer and publish data on the Internet we want to create a framework not a ready to use application the project is based on several other open source projects News	Szonja Zemko Dániel Moka Tamás Király Viktória Zubály József Jankó Dávid Bánhidi Bence Turák Máté Kecskeméti
• Google Maps API 3	Vew Blue looth Interface for sensor communication 2019.10.01. Qt4 library dependency removed from xml file creation and reading, xml.etree is used instead 2019.08.04.	Bence Hrutka
	Presentation at OGRS (Open Source Geospatial Research & Education Symposium) 2018, Lugano and a paper .	• Leica TCA1800
	SQLite writer added to writer family of robotplus application 2016.09.04.	Leica TCRP1201+ Leica TCRA1103 Leica DNA03
	First real life application of robotplus started in Budapest 2017.09.01. Raspberry Pi camera integrated into the system. 2016.02.09.	Garmin GPS18 Leica GPS 500
	New apps were created to serve monitoring tasks robot.py and robotplus.py. 2016.01.30. video	 TopCon HiperPro II USB WebCam Adafruit BMP180
	Dowload meteorological data with webmet (virtual) sensor. 2015.12.15. Collecting and Processing Land Surveyors' Sensor Data presentation at FOSS4G Europe 2015, Como	 Adafruit LSM9DS0 RasPi camera RasPi SenseHat
	First 9 DOF sensor (FLORA Adafruit LSM9DS0) integrated through the i2c interface of a Raspberry Pi. It can be used for indoor navigation, 2015.05.22.	Used Open Source



