

Problems and challenges of present geodesy in Poland

Speaker: Ph.D. Eng. Artur Plichta



Four minutes about our university....



Faculty of Civil and Transport Engineering



The structure of the Faculty:

- Institute Of Building Engineering
- Institute Of Civil Engineering
- Institute Of Structural Analysis
- Institute Of Machines And Motor Vehicles
- Institute Of Combustion Engines And Powertrains
- Institute Of Transport







The fields of study:

- Building Engineering (about 240 students)
- Sustainable Building Engineering (in English) (about 60 students)
- Mechanics and vehicle construction
- Aviation and space
- Transport







Institute of Civil Engineering



The structure of Institute of Civil Engineering:

- Division of Road Engineering (Head: Mieczysław Słowik)
- Division of Bridges and Railway Engineering (Head: Włodzimierz Bednarek)
 - Office of Bridge Engineering (Head: Wojciech Siekierski)
 - Office of Railway Engineering (Head: Michał Pawłowski)
- Division of Geotechnics, Engineering Geology and Geodesy (Head: Katarzyna Machowiak)
 - Office of Geotechnics and Engineering Geology (Head: Michalina Flieger-Szymańska)
 - Office of Geodesy (Head: Artur Plichta)
 - Laboratory of Computer Methods (Head: Albert Kubzdela)
- Research Laboratory of Institute of Civil Engineering (Head: Krzysztof Ziopaja)







Management of the Institute:

Director: Mieczysław Słowik Deputy Director: Iwona Jankowiak

Institute staff:

- 3 Associate Professors
- 3 academic teachers with Ph.D., D.Sc. title
- 18 academic teachers with Ph.D. title

- 8 other academic teachers
- 2 administrative employees
- 7 technical employees







Research areas and projects





Research areas:

- Road pavement diagnostics
- Research on bridge structures
- Research on railway track geometric layout
- Road, tram and rail traffic engineering
- Testing of construction materials
- Surveying measurements
- Creating integrated GIS systems











Ph.D. Eng. Artur Plichta Institute of Civil Engineering





Current Research project (2022):

• "Support system for the management of the street network in Poznan city", ZDM Poznań







- Damages
- Bad quality
- Ruts



Department of Geotechnology, Engineering Geology and Geodesy



STAFF

DEPARTMENT OF GEOTECHNOLOGY, ENGINEERING GEOLOGY AND GEODESY





DIDACTICS

- Basics of surveying
- Engineering Measurements
- Surveying Measurements Training two weeks (90h) in summer

BOOKS

- Wyczalek I., Mrówczyńska M., Plichta A., Situational measurements in engineering practice, Ed. Poznan University of Technology, 2018
- Wyczalek I., Plichta A., Map in engineering practice, Ed. Ed. Poznan University of Technology, 2020
- Wyczalek I., Plichta A., Height and situational measurements in engineering practice, Ed. Poznan University of Technology, 2022



SCIENCE / RESEARCH dealing with *present geodesy problems* in Poland

- Land Information Systems
 - Numerical maps
 - Conceptual and physical modeling (UML, Toad Data Modeler)
 - Databases
- Cadastre and Land Registry
 - Correctness
 - Data acquisition
- Geographic Information Systems
 - Spatial / attribute data and their usage



• Land Information System for surveyors and public offices





- Rail Land Information system:
 - Revision of database





2. Map





UML Conceptual model





6. Rail LIS:





• PROBLEM:

• Anauthorized construction









- ADJUSTING:
 - * Fitting:
 - * Accuracy to 3px
 - * Assumption 1px \approx 1.5 cm accuracy develop about 4.5-5.0 cm
 - * Accuracy:
 - Situation accuracy not less than the measurement of GPS-RTK
 ≈ 3-5 cm
 - * accuracy of the altitude not less than \approx 5-8 cm
- CORRECTNESS
- REVISION OF DATABASES













Example.....







https://poznan.obliview.com/



The use of geographical information systems to support the management of elements of the technical infrastructure in the field of water supply and networks.



Location of valves closest to the point of failure



Buildings without water as a result of failure





The map determining access from emergency station to the point of failure



Map of the ranges of service staff access in intervals 1min, 3min, 5min



- ✤ Would you tell me, please, which way I ought to go from here?
 - That depends a good deal on where you want to get to, said the Cat.
- ✤ I do not much care where.
 - Then it does not matter which way you go, said the Cat.
- So long as I get somewhere, Alice added as an explanation.
 - Oh you are sure to do that, said the Cat, if you only walk long enough.

Lewis Carroll, Alice's Adventures in Wonderland

