Experience of the Faculty of Mathematics and Information Science in mobile data processing and interpretation

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Faculty of Mathematic and Information Science

- We combine complex computer science techniques with rich mathematics background
- The faculty has extensive experience in collaboration with business in Research and Development projects
- At the faculty, a special unit that manages projects in collaboration with business exists
- The R&D projects done by faculty are founded by local and international enterprises, The National Center for Research and Development and European Union
- The faculty co-organizes international conferences incl. International Conference on Innovative Network Systems and Applications

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Applied Research Center

- Applied Research Center is a special unit created at the Faculty of Mathematics and Information Science to cooperate with business in Research and Development projects
- Projects from mobile networks area done so far:
  - Signal strength data analysis
  - Indoor localization of mobile terminals
  - QoS measurements for mobile services
  - Cyber-threats detection
  - Development of reference data sets from raw network data
    - Anomaly detection
    - QoS testing

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LOKKOM project

- **LOKKOM** *Complex methods of mobile network terminal in outdoor and indoor conditions.* The research is supported by the National Centre for Research and Development, grant No. PBS2/B3/24/2014, application No. 208921
- The primary objective of the project is to develop positioning methods for mobile network terminals. The methods are used to estimate the location of a terminal (such as mobile phone) both in outdoor and indoor conditions, including multifloor buildings.
- Such methods provide basis for novel Location Based Services, including these offered to all terminal users, irrespective of terminal type, in particular terminals based on different operating systems and including different sensors and radio interfaces.
- Basing on the data set collected in indoor and outdoor environments data preprocessing methods and mathematical positioning methods are developed using the methods and techniques of different areas of mathematics and machine learning.

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VaVeL project

- **VaVeL** *Variety, Veracity, VaLue: Handling the Multiplicity of Urban Sensors*
- Project supported in European Union Horizon 2020 Programme, call **H2020-ICT-2015** ***Big Data***, subject ICT-16-2015 with highest evaluation in the call.
- This project will develop a general purpose framework for managing and mining multiple heterogeneous urban data streams for cities to become more efficient, productive and resilient.
- The framework will be able to solve major issues that arise with urban transportation related data and are currently not dealt by existing stream management technologies, using data from city systems (City of Warsaw, Dublin City Council) and mobile network operator (Orange)
- The processing of mobile network data is one of key aspects

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