About the course

- Advanced course:
  - Main specialization: Networking and Services
  - Secondary specialization: Algorithms, Data Analytics and Machine Learning, Data Science
  - 6 credit units for passing the course
    - Lectures and weekly exercises
    - Home exam at the end of the course
    - Mandatory project work (approx 2 credit units)
  - Passing the course requires at least 50% of points from home exam and exercises + successful completion of project work
About the course

• Course webpage
  • https://www.cs.helsinki.fi/courses/582760/2016/s/k/1
  • Course material and exercises will be available in electronic form from the webpage

• Exercises
  • Have to be returned electronically to the instructors, minimum 15 minutes before the exercise session
  • The exercises will be available from the course webpage
  • Solutions published online after the exercise session
Prerequisites

• Mathematics:
  • Understanding of basic concepts in geometry, linear algebra and calculus
  • Knowledge about basic concepts in probability and statistics

• Programming:
  • Capability to implement algorithms for processing location measurements
  • Implementation language can be chosen freely, but preferred languages Matlab, python, Java, R
Objectives

• Understand how location information can be measured and represented
• Obtain basic knowledge about approaches to positioning and be able to apply this in practice
• Learn basics of spatial data analysis and be able to identify patterns from location measurements
Outline

• Location-Awareness
  • Coordinate systems and other basic concepts
  • Location-Based Services
• Positioning and Location Systems
  • Positioning Algorithms
  • Measuring Location
• Spatial Analysis
  • Clustering, Indexing, Preprocessing, Filtering
  • Place Detection, Trajectory Mining, Recommendations
• Focus on techniques/algorithms for analyzing and processing location data