

Geoinformatics, software development and domain knowledge

Industry expectations



Aalto University
School of Engineering

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Introduction

- The Aalto University geoinformatics master's program has a steering group that meets approximately once a year
- From the steering group we can get their expert opinion on industry expectations for our graduates
- I will here present both what we have in the program, and what the steering group considered important

GEOINFORMATICS

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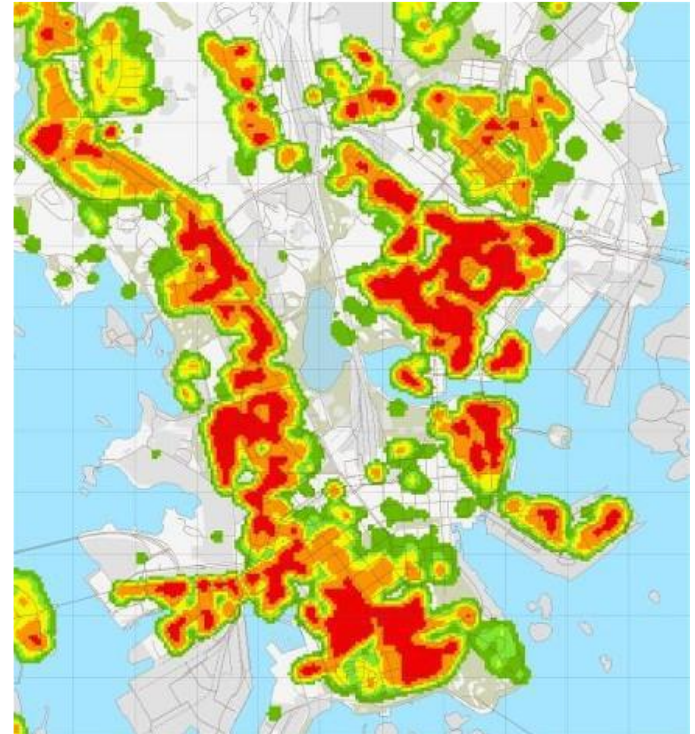
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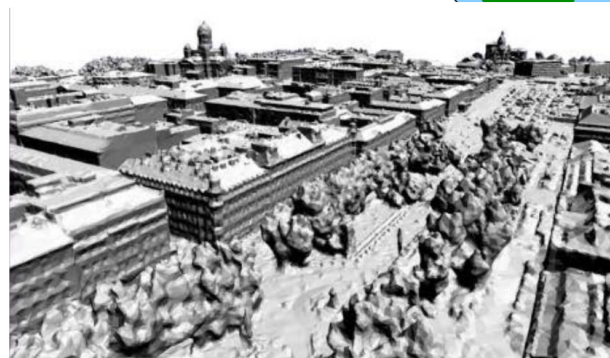
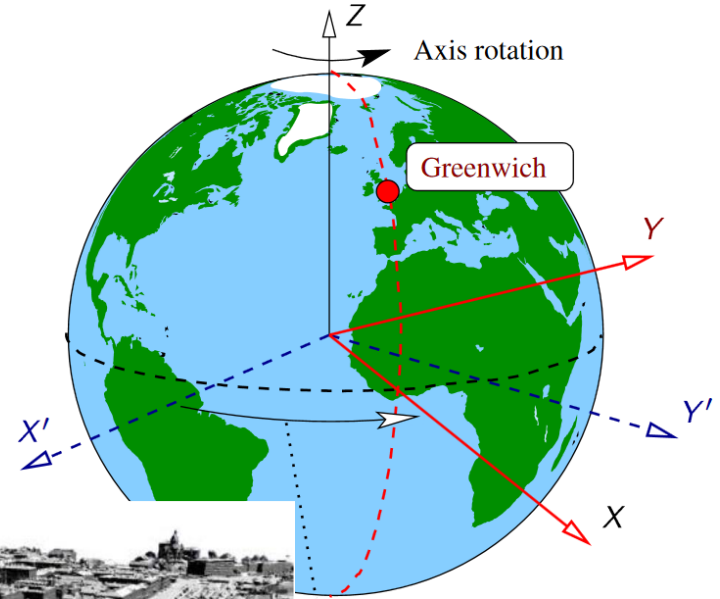
Geoinformatics (spatial data science) expertise

- **Spatial data theory and techniques**
 - Underlying mathematics
 - Algorithms, methods and data models
- **Spatial data analysis**
 - Basic methods and techniques
 - Spatial statistics
 - Advanced methods
- **Spatial data management**
 - Data modeling and management
 - Data sets available
- **Spatial visualization**
 - Web map design
 - Interactive maps



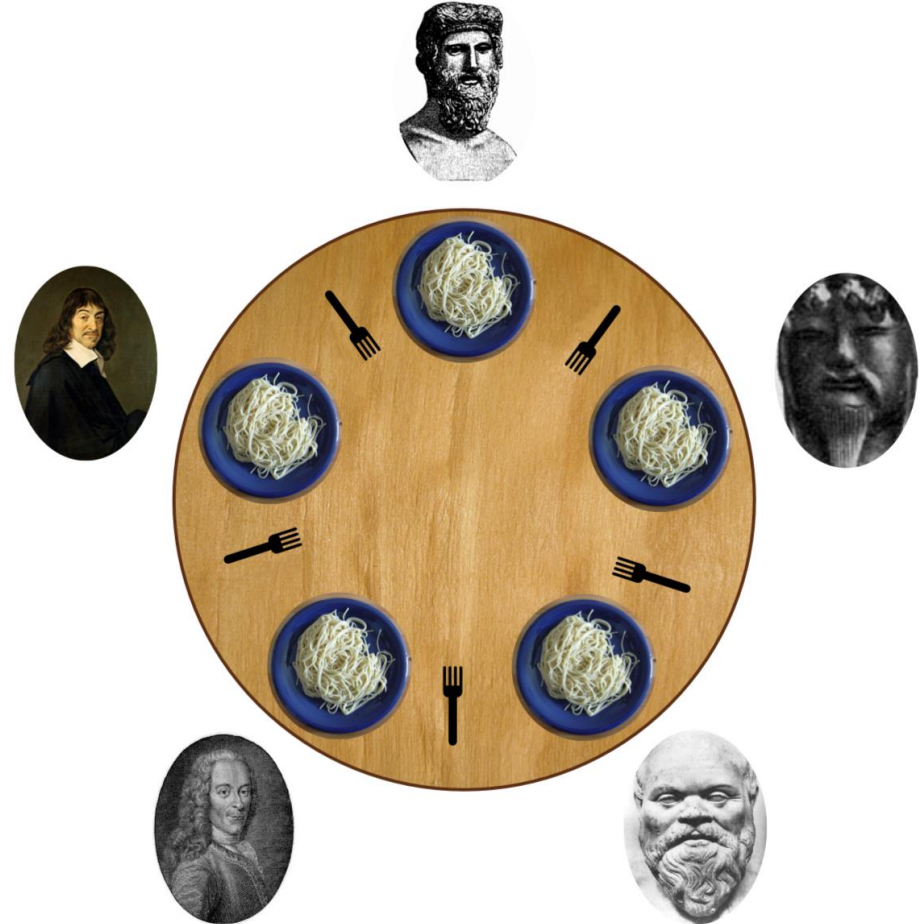
Geodesy, remote sensing, photogrammetry, and laser scanning

- **Vital parts of the Aalto geoinformatics curriculum**
 - Just mentioned here – I am not an expert on these topics
- **Geodesy**
 - Positioning, navigation, reference systems, etc.
- **Remote sensing**
 - Satellite imagery
- **Laser scanning and photogrammetry**
 - Terrestrial, mobile, airborne



Software development skills

- **Programming**
 - Multiple languages: python, R, matlab, etc.
- **Algorithms and methods**
- **Software engineering**
 - Software design and development
 - Software project expertise
- **Database use and maintenance**
 - Spatial data in databases
 - SQL and NoSQL
- **Web development**
 - Sharing and visualizing spatial data (download – interface – view)



Other work skills

- **Reading and writing scientific text**
- **Quality assessment (for data)**
- **GIS software skills**
- **Knowledge and skills regarding appropriate instruments**
- **Self-reflection and -assessment**
- **Ability to grasp new problem solving methods**
- **Group work skills**
- **Textual and oral presentation skills**
- **Historical knowledge**
- **Understanding of possible applications**
- **Design and implementation of complex measurement settings**
- **Critical thinking and creativity**
- **Business knowledge (esp. Start-ups)**
- **Project work and communication skills**

Essential work skills (from steering group)

- **Financial skills**
 - Budgeting skills
 - Cost awareness
 - Taxation expertise
- **Legislative expertise**
 - Contract law
- **Ability to take initiative**
- **Ability to justify decisions**
- **Salesmanship skills**
 - Selling your ideas
- **Self-promotion skills**



Useful work skills (from steering group)

- **Marketing and sales skills**
 - Making a sale
- **Acquisition process knowledge**
- **Government and municipality decision making process knowledge**
- **Leadership skills**
- **Ability to instruct people**



Thank you!