

# GeKon

## applying novel approaches to GIS development

Tomáš Richta

[cs.felk.cvut.cz](http://cs.felk.cvut.cz)

# Outline

- Introduction
- Object-oriented approach
- GeKon project
- Conclusion and future work

# Introduction

- GIS evolution
  - digitalization of cartography
    - points, lines and polygons
  - additional information
    - DBF files, images
- Present GIS data management
- Semantic gap

# Present GIS data management

- SHP, SHX, DBF, SBN, SBX files
- SQL databases
- high level of granularity
- layered structure
- no topology
- primitive geometry
- sophisticated analyses



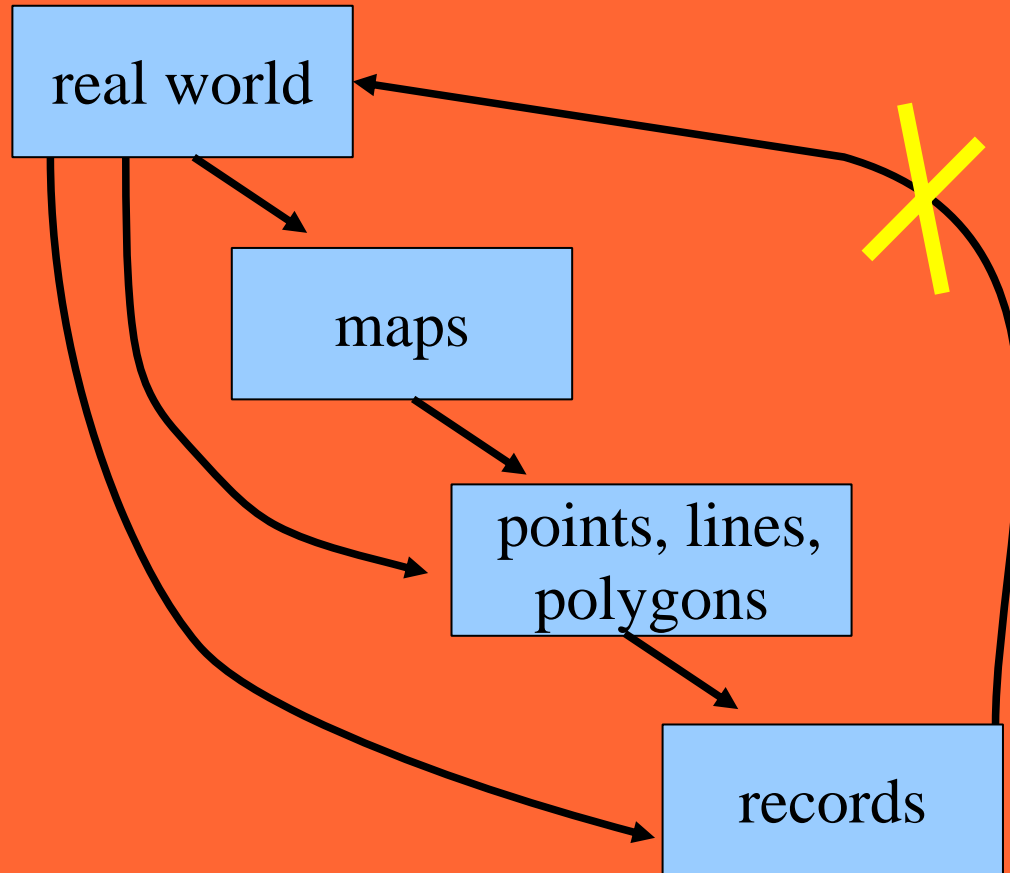
- Layers
- Vodstvo\_linie
  - Tramvajove\_trate
  - Roads
  - Metro\_stanice
  - Parkove\_cesty
  - Metro
  - Adresni\_body
  - Budovy\_polygony







# Semantic gap



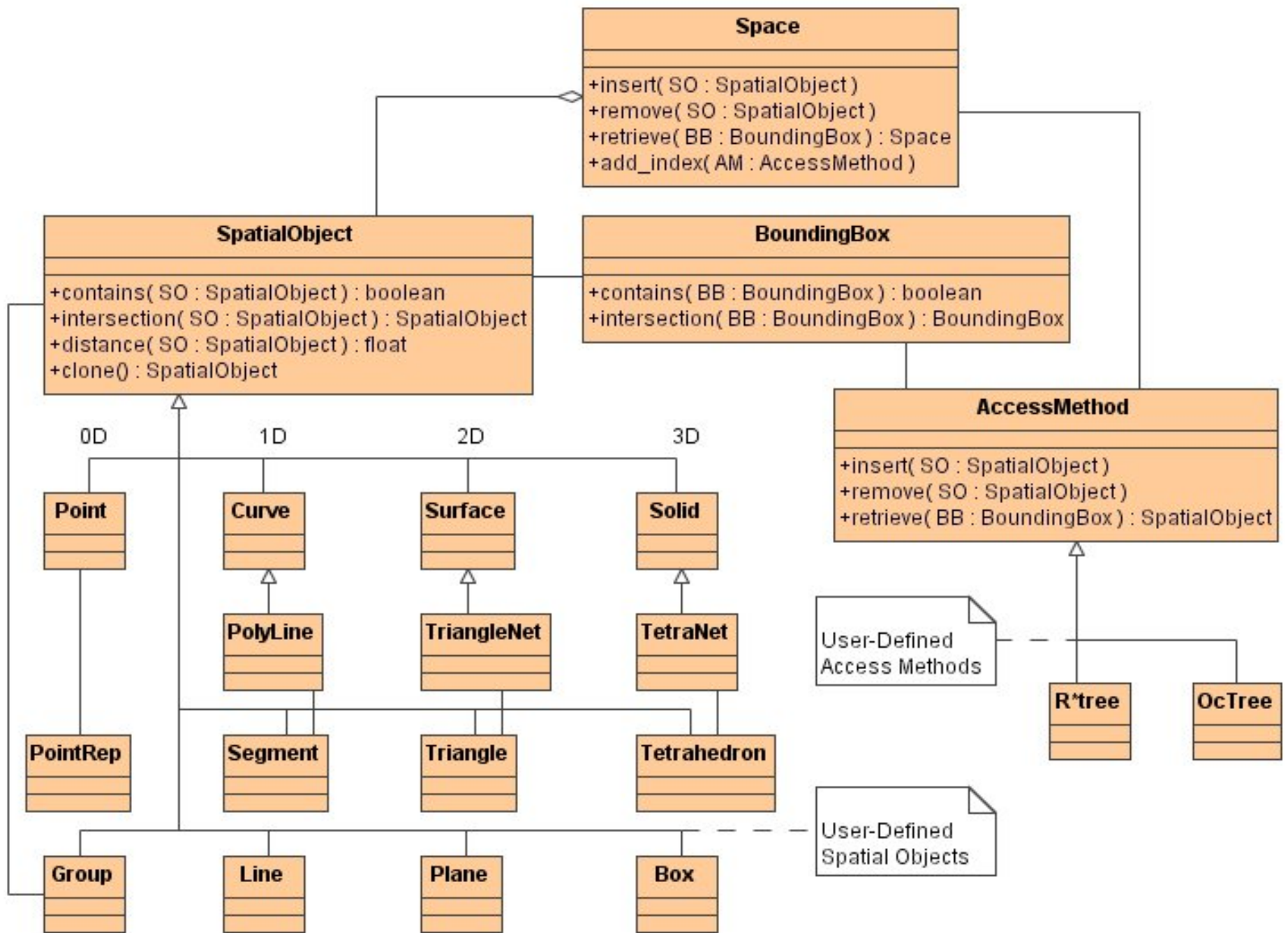


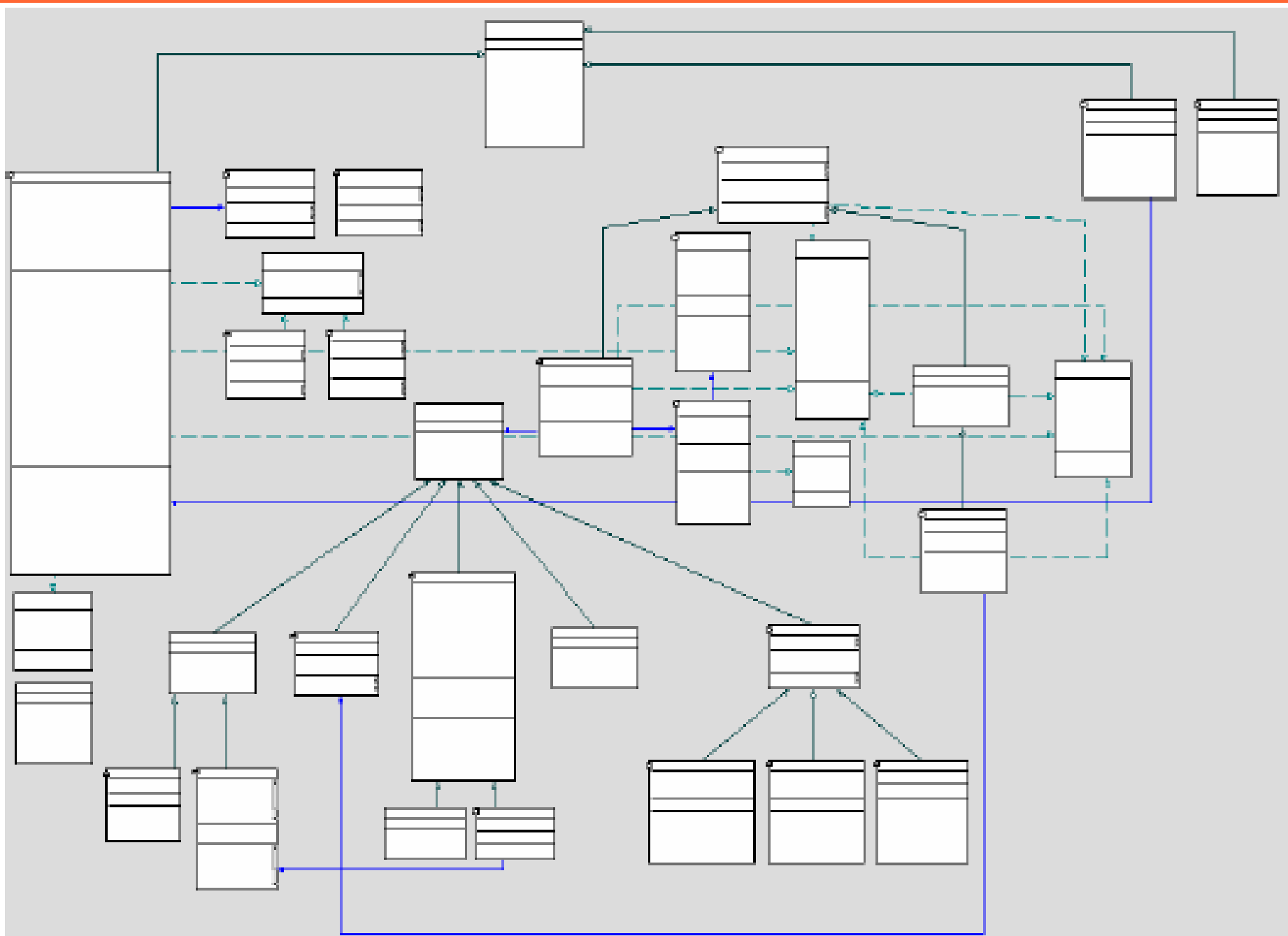
# Object-oriented approach

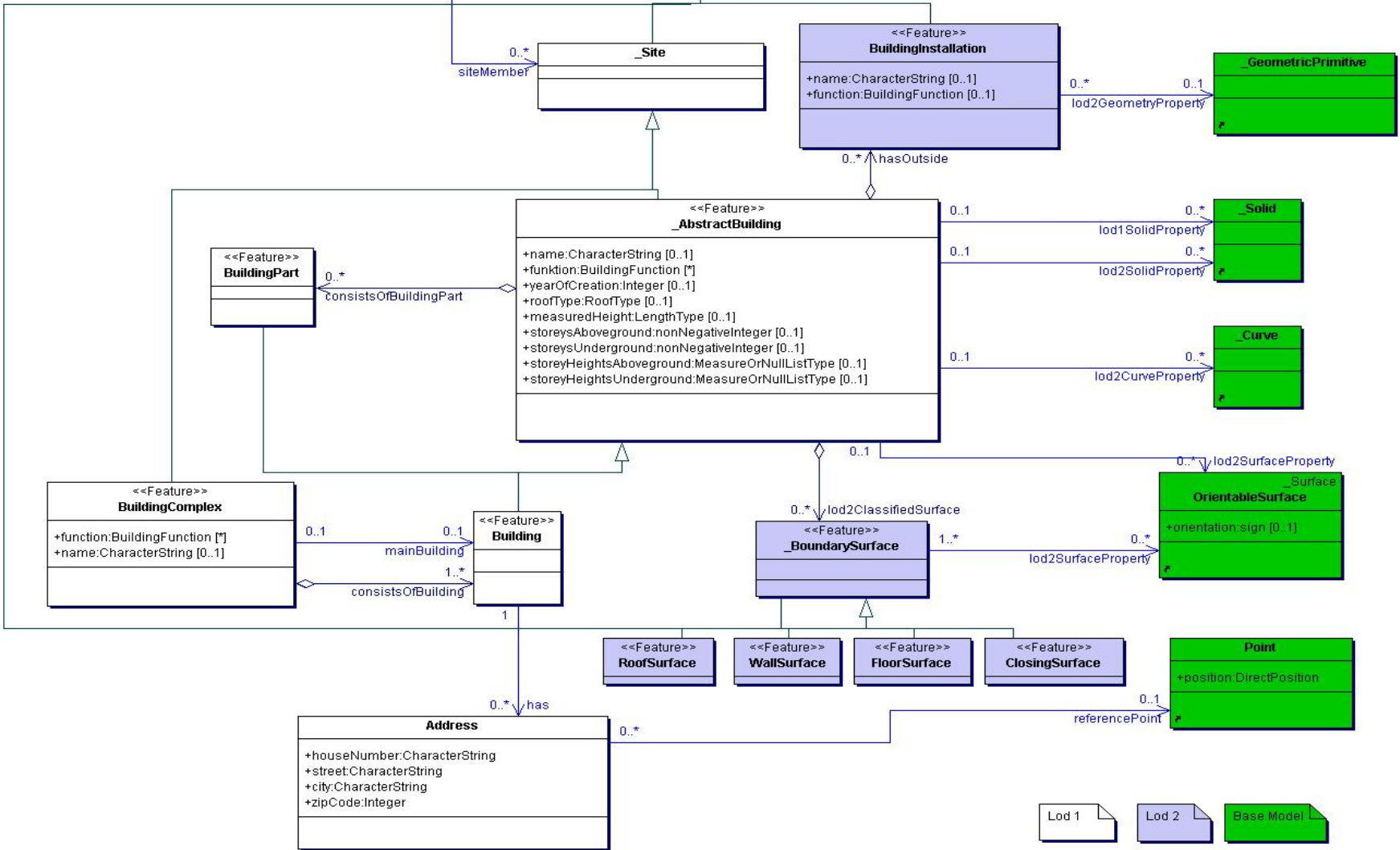
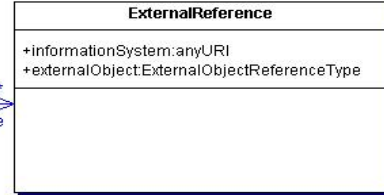
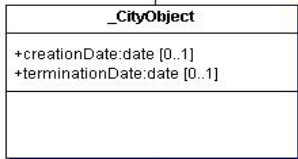
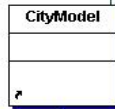
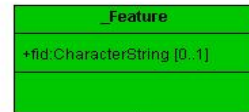
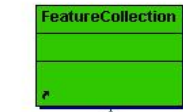
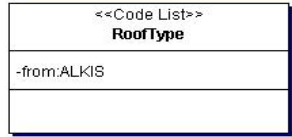
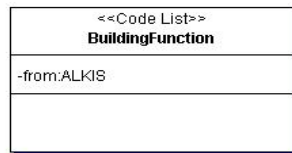
- OOA as the solution of the problem
  - data and functionality are encapsulated
  - objects communicate by messages
  - objects are able to inherit properties
  - objects are collected in classes
  - objects could have relationships
- Object-oriented modelling
- GIS development projects

# Object-oriented modelling

- Balovnev et al. (1999) – GeoToolKit
- Nebiker (2003) – DILAS server
- Kolbe & Goeger (2004) – CityGML





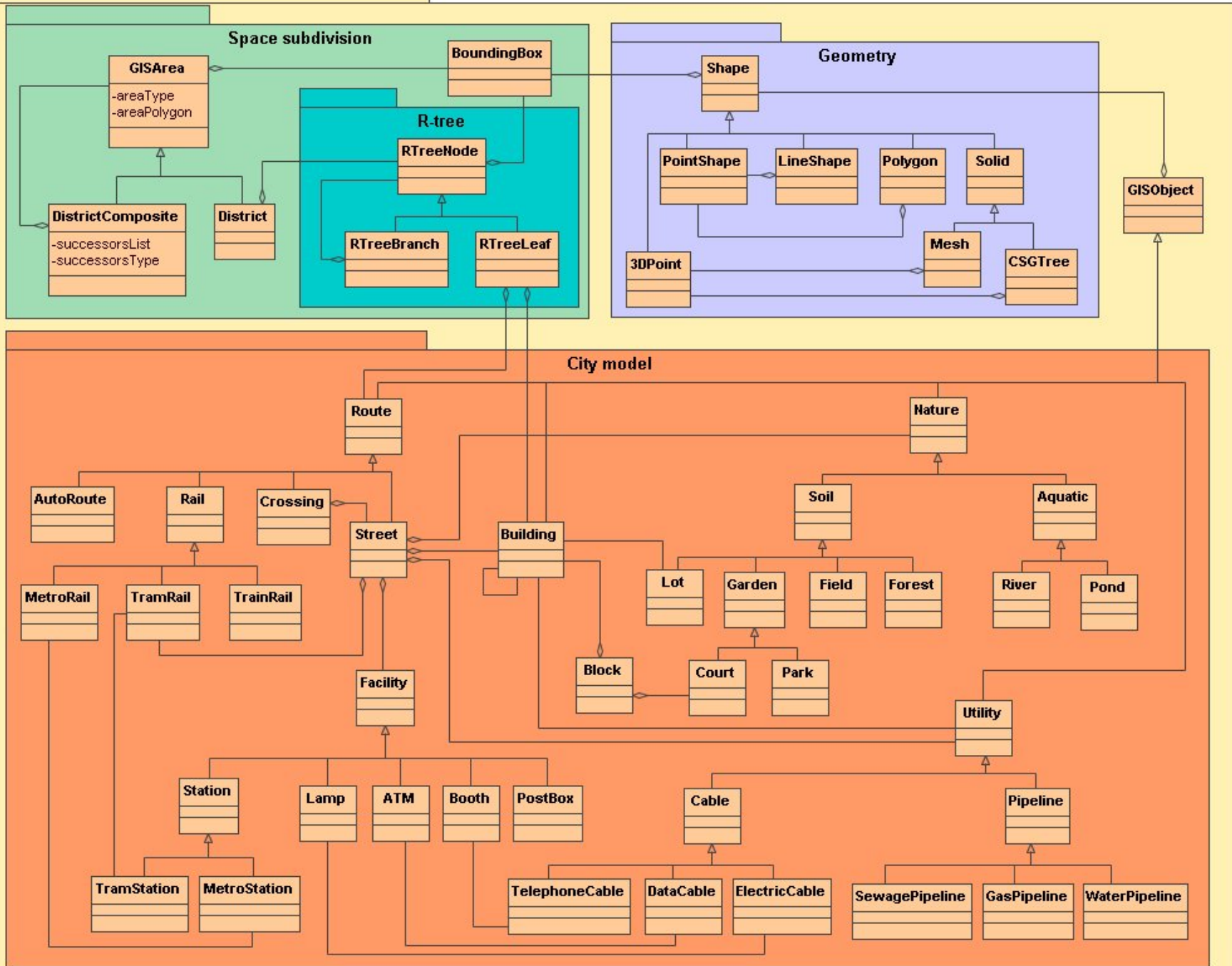


# GIS development projects

- Papers
  - Michael Kofler (1998) – R-trees for visualizing and organizing large 3D GIS databases
  - Balovnev et al. (1999) – GeoToolkit
  - Lurie et al. (1997) – A Smalltalk-based extension to traditional GIS
  - Chance et al. (2000) - Smallworld GIS: An object-oriented GIS – issues and solutions

# GeKon project

- student project
- under development
- primarily designed as data convertor
- could serve as a classical GIS
- Squeak Smalltalk
  - Morphic
  - Shapes
  - OmniBase







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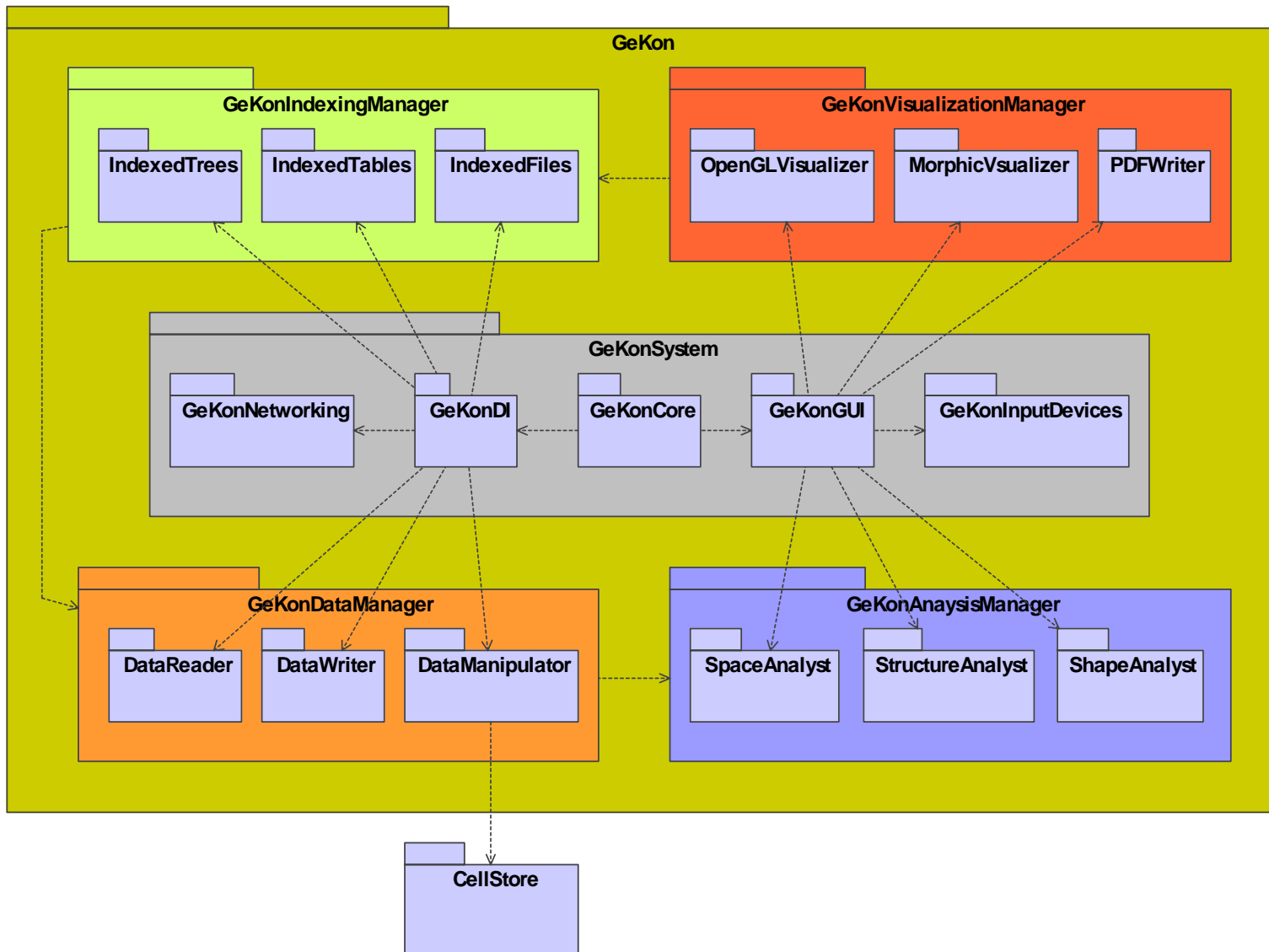
# Conclusion and future work

- GIS development requirements
- Further steps in GeKon project

# GIS development requirements

- separate geometric representation
- use proper indexing structure
- build the system from user interface
- let the user construct the domain model
- incorporate only pure object technologies

# Further steps in GeKon



Thanks for your attention