OpenSpace Software Architecture

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“I see this as the essence of open source projects: The energy and creativity of many people with diverse goals together can work miracles”

-Guido van Rossum
Topics

• Software design process
• Desired characteristics
• Application schematic
• Spatial method definitions
• Tasks
Design process

• Define software vision
• Define requirements
• Write specifications
  – Use case
  – Scenarios
• Generate object design
• Write and test code
• Task Architect role
Desired characteristics

- Data standards compliant (OGIS, etc.)
- Multiplatform (hardware, OS)
- Multilingual (output & prog. languages)
- Scaleable (problem size; desktop <> distributed)
- Modular
- Process-standards compliant (testing, coding, documentation, metadata)
UI

k-NN

LISA

My new method

Backbone

Widgets

DATA
Swidget Library

• Provides common functionality
• Optimized for speed
  – Procedural rather than OO?
• Multilingual (C++, Fortran etc.)
• Gateway for existing libraries?
Spatial methods definition
Tasks

- The swidgets library
- Spatial methods space
- Standards
- Interfaces
- The OpenSpace process
Define Swidgets library

• What is a swidget?
• Enumerate types of swidgets
  – Linear algebra
  – Distributions, statistical building blocks
• How to link to existing swidgets?
• What languages are supported?
  – Fortran, C++, Pascal, Java?
Define spatial methods space

• What types of methods will be supported?
  – Geostatistical
  – Spatial econometric
  – Inferential
  – Clustering
  – Visualization
  – Etc.

• What level of abstraction? E.g. plot(model.obj)?

• Enumerate known methods for each type

• Define data and I/O reqs for each method
Standards

• Define the characteristics of coding, documentation and testing standards

• Metadata definition
  – Swidgets
  – Spatial methods

• Standards for representing and propagating uncertainty
Interfaces

• Define the generic interface for
  – Swidgets
  – Spatial methods

• Define the interface to GIS, decision support, and statistical software systems
The OpenSpace process

• GOAL: put in place a self-monitoring and self-sustaining OpenSpace process & repository
• Rigorous definition of Scope!
• What is the process for adding a Swidget?
• What is the process for adding a method?
  – Peer review process? OpenSpace methods board?
• What models exist for the OpenSpace site?
• What license should be used?
• How best to prepare for the “handoff”?