

GeoDesign

Bridging GIScience and Design Disciplines

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GeoDesign

- Design at geographic scale
- Designing solutions for spatial problems (e.g. designing an urban renewal area, a highway, conservation plan for a treasured landscape, recovery actions for an endangered species, etc.)
- Designers: anyone who is designing the problem solution (public, stakeholders, architects, landscape architects, planners, domain experts, engineers, land managers, GIScientists, etc.)
- Collaboration among designers (→ PGIS, PPGIS)
- Concept born out of the need for doing science-based, evidence-based design in GIS, and the technology supporting the designers for doing it
- Events lending momentum to this new area of study:
 - Spatial concepts, GIS and Design specialist workshop, UCSB, December 2008
 - GeoDesign Summit, UCSB, U. of Redlands, ESRI, January 2010

GeoDesign Summit

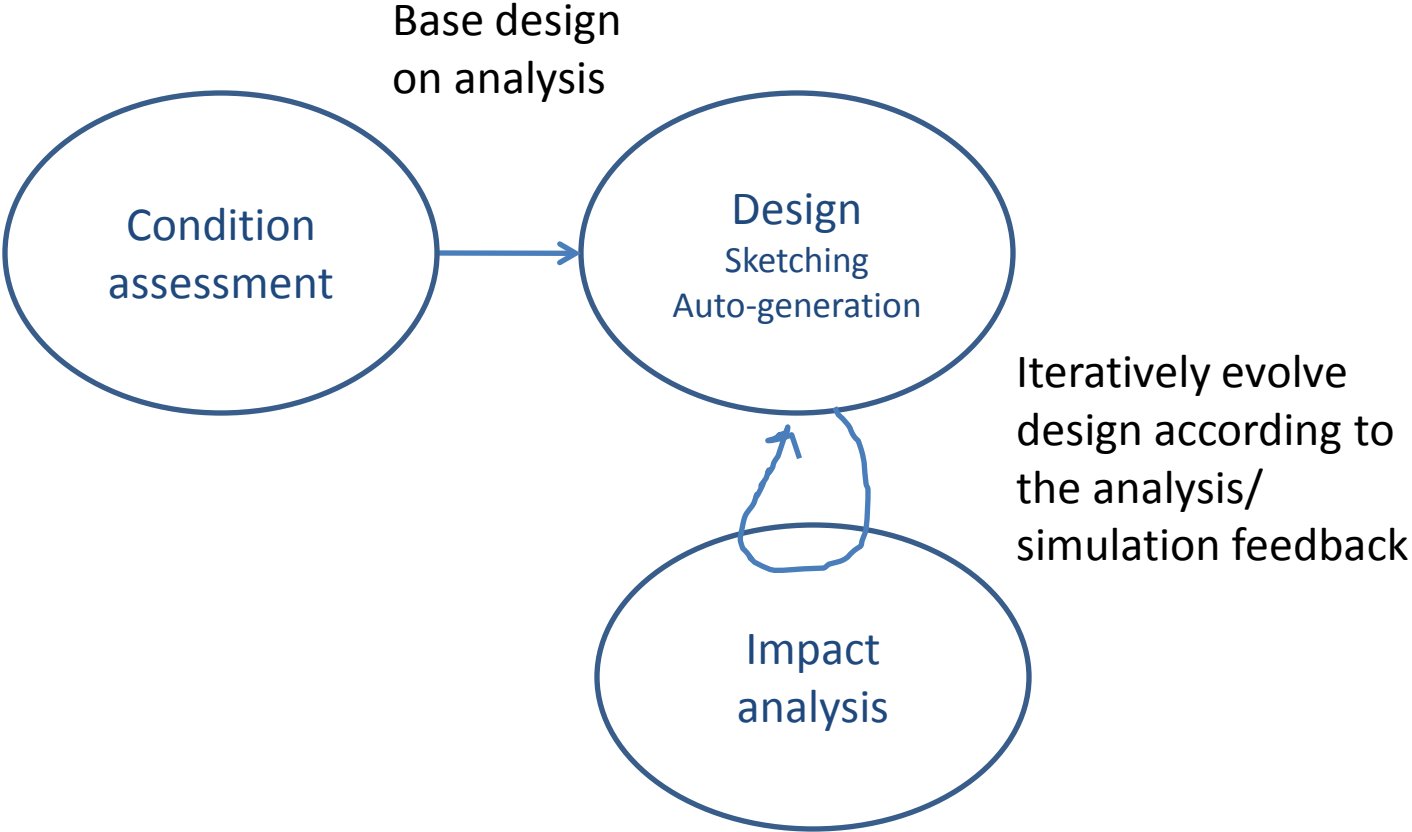
- Participants include GIScientists, professional designers (architects, landscape architects), planners, engineers, non-profit conservation organizations, spatial decision support practitioners, tool makers, government agencies
- Presentations on past work in the spirit of GeoDesign across all sectors
- Topic areas covered:
 - GeoDesign research agenda
 - GeoDesign in education
 - GeoDesign in urban areas
 - GeoDesign at landscape and regional scales
 - Sketching inference and feedback
 - Participatory GeoDesign
 - Analysis, simulation and assessment
 - The role of 3D in GeoDesign
 - GIS for BIM
- Potential Funding opportunities for research, education, practice, technology development
- GeoDesign Summit 2011 (ESRI distancing itself)

GeoDesign

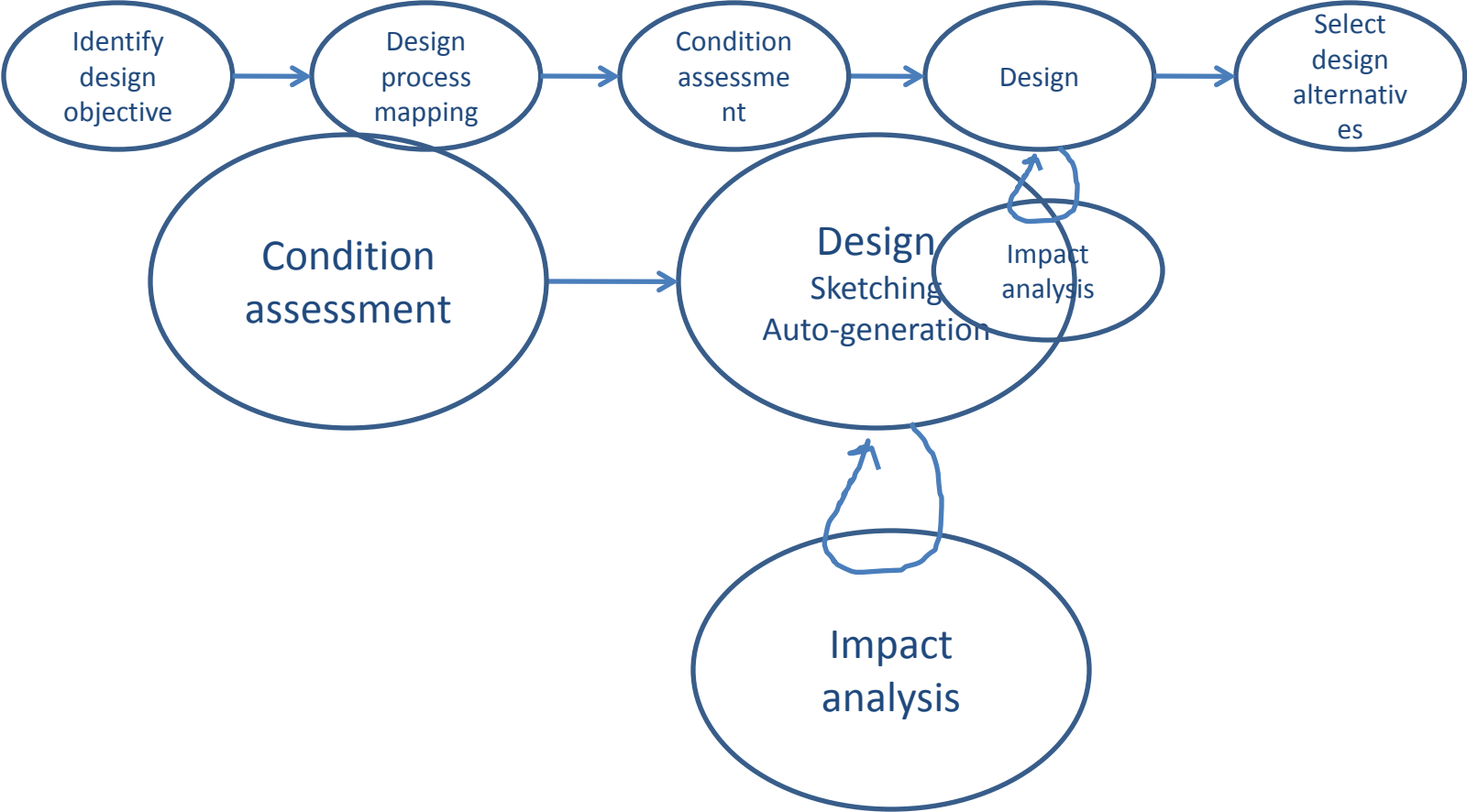
Unlike conventional design, GeoDesign is informed by science and logic:

- Based on, among other things, geospatial **analysis** of current state of the system (data development including data model development, domain process model development, analysis and evaluation)
- Evolving according to, among other things, **feedback** of geospatial analysis, including impact analysis, geosimulation
- The design, background information, feedback are done through **visualization and story telling** in geographic space, facilitating communication to public/decision makers
- **Holistic design** can easily be achieved
- The design can easily done in **collaboration and participation environment**

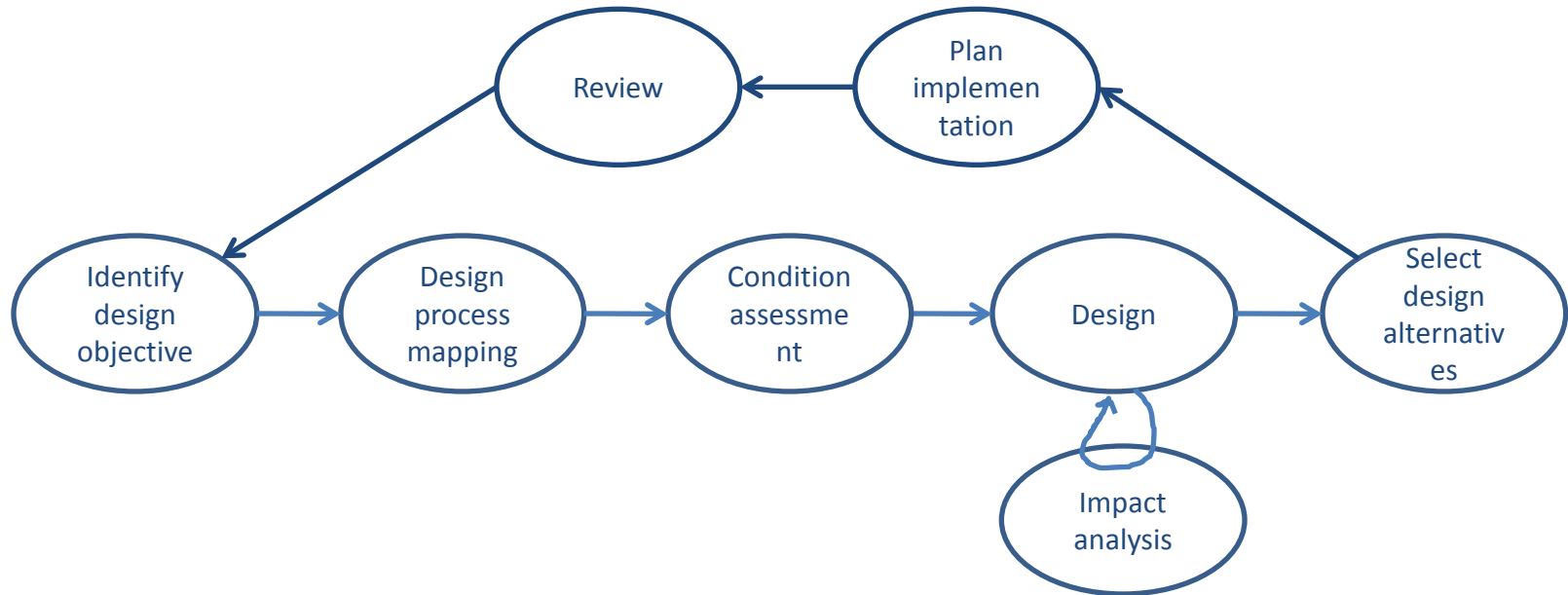
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GeoDesign Process Workflow



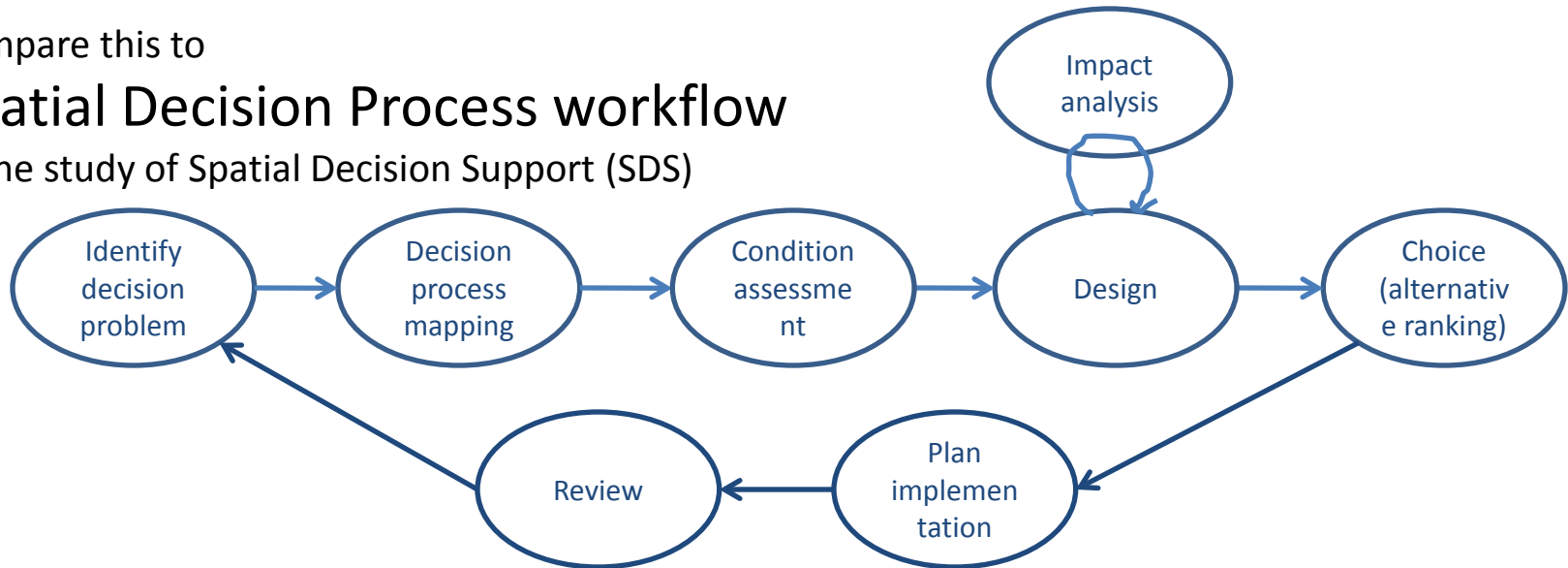
GeoDesign Process Workflow



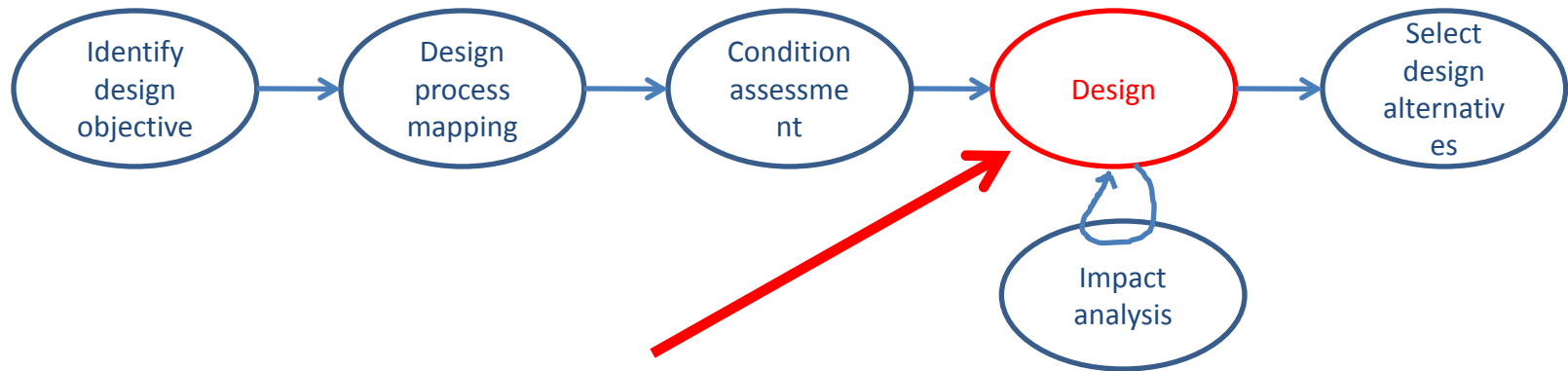
Compare this to

Spatial Decision Process workflow

in the study of Spatial Decision Support (SDS)



GeoDesign Process



Currently, designers often have to leave GIS environment to do sketching with pen and tracing paper on top of condition assessment maps (e.g. suitability maps with base maps), making it difficult to produce instantaneous feedback on design (from, e.g. impact analysis). This situation can be remedied by developing technology for semantics-driven sketching in GIS environment, which will facilitate a smooth GeoDesign workflow in GIS environment.

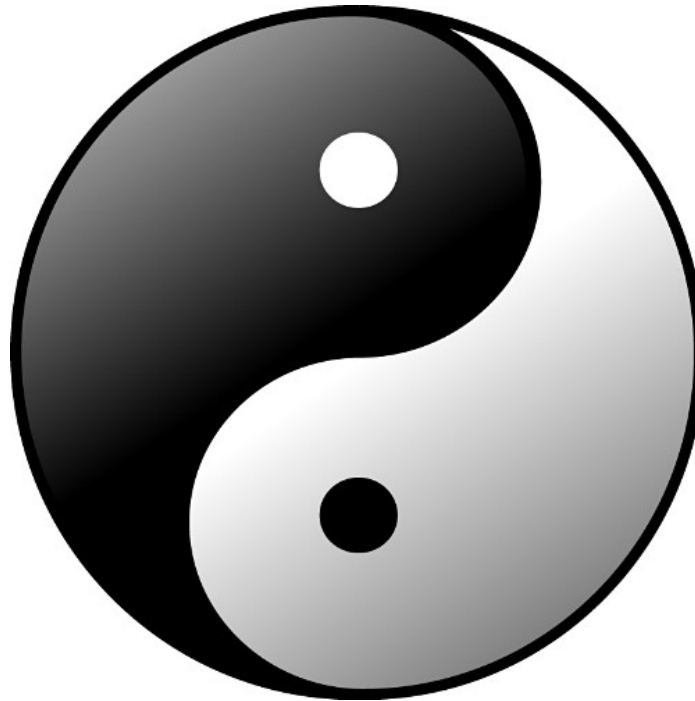
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New interdisciplinary areas of study

- There are strong links with the place-based initiative of the White House
- This is a significant opportunity to build bridges between GIScience and the design disciplines, all UCGIS member institutions should be thinking about how it can be leveraged on their own campuses
- A persistent theme of the meeting was to see GIS as providing a more scientific basis for planning - especially evaluation of plans against scientifically valid criteria. This is a paradigm shift for many design schools with their dominant emphasis on aesthetics - and a strong basis for breaking down academic stovepipes using GIS as the common language

GeoDesign: A Problem in Two Related Parts

Sketch
Record



Evaluate
Analyze
Predict
Modify
Improve



GeoDesign

Opportunities:

- Study the coupling between science and design
- Study the interaction between science-/evidence-based reasoning and creative activities. E.g. How to support designer's abductive thinking during design?
 - How do MCDA work with design methods? How can MCDA support design activities?
- How to work with Designers' values regarding forms and aesthetic values?
 - Can GIS capture the aesthetic values expressed by designers and stakeholders? Through functions of the designed forms?
- Augment the body of knowledge in SDS (e.g. the ontologies in SDS Knowledge Portal) with conceptual design specific processes, methods, technology
 - Augment SDS with methods in GeoDesign methods from designers, relations between spatial decision problem parameters with design methods, etc.

5 Design Strategies

ANTICIPATORY

HOLISTIC

DEDUCTIVE

SEQUENTIAL

DIRECT

ABDUCTIVE

COMBINATORIAL

SIMULTANEOUS

INDUCTIVE

CONSTRAINING

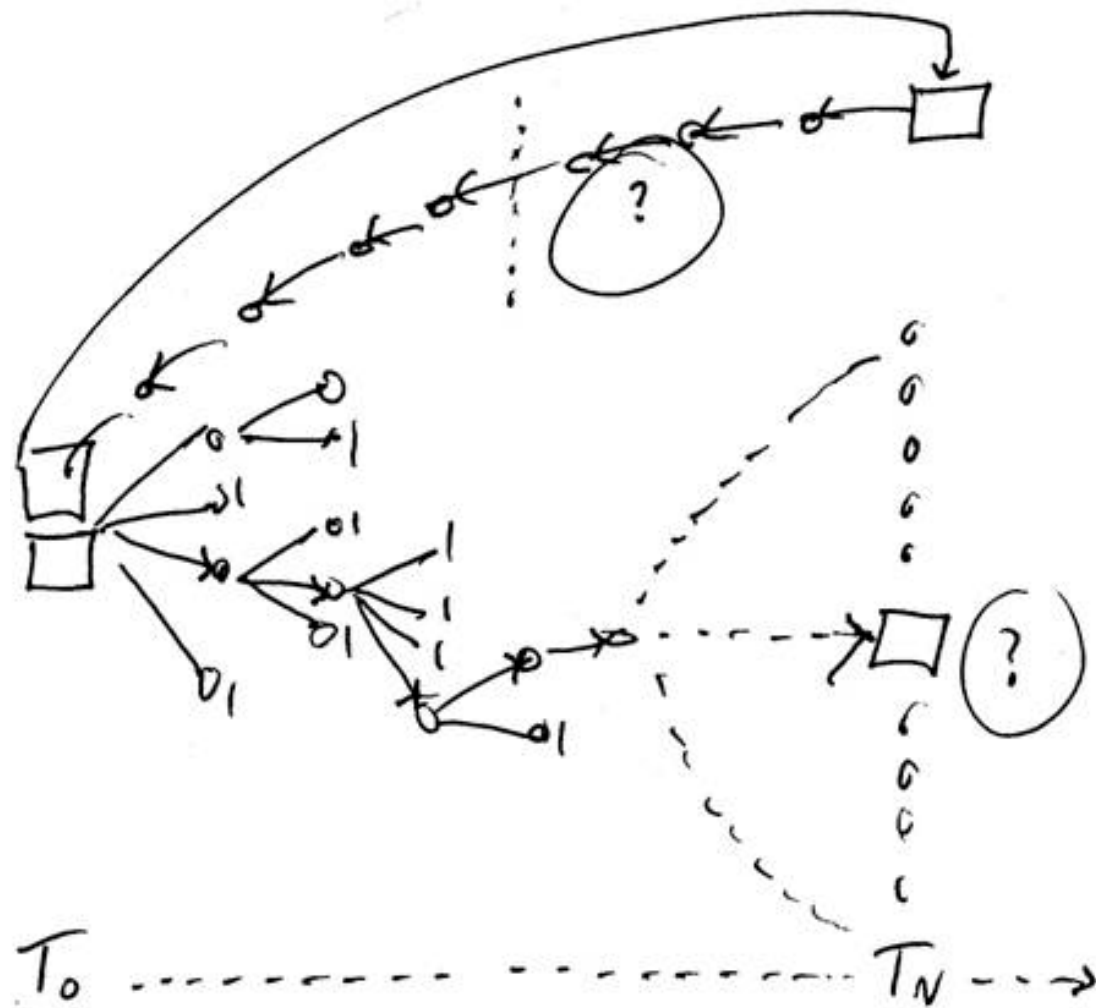
SENSITIVITY

EXPERIMENTAL

OPTIMIZING

DIRECTED

OBJECTIVE-DRIVEN



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Resources:

- Wikipedia entry “GeoDesign”: <http://en.wikipedia.org/wiki/Geodesign>
- Specialist Workshop on Spatial Concepts, GIS and Design:
<http://ncgia.ucsb.edu/projects/scdg/>
- GeoDesign Summit: <http://www.geodesignsummit.com/>
- Spatial Decision Support Knowledge Portal:
<http://www.institute.redlands.edu/sds/welcome.html>
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