Spatial Concepts

in GIS and Design

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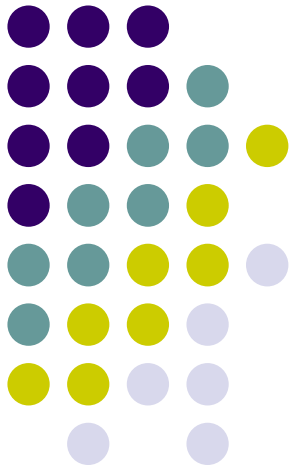
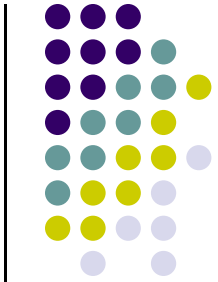


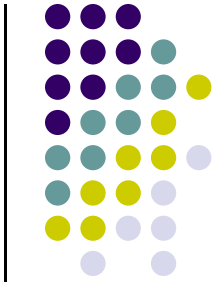
Panel: Tuesday, 3/24/09, 3:10 PM - 4:50 PM, Capri 107, Riviera Hotel

Three points:



1. **GIS** and Spatial **Design** stem from **contrasting** though **symmetric** perspectives
2. This suggests both strong **connections** and critical **differences**
3. For discussion:
   - The spatial **concepts** are the **same** for both
   - The **differences** lie in the **value** and **use** of these concepts

Contrast the dominant positive stance of GIS with the normative stance of the design sciences:



GIS & TRADITIONAL SCIENCES	THE DESIGN SCIENCES
Analysis	Synthesis
From instances to principles	From principles to instances
Causal	Purpose-oriented (telic)
Descriptive	Prescriptive
Positive	Normative (deontic)
IS	*OUGHT*

From Stephen Ervin's* presentation (slide #1)

Can we enumerate some 'fundamental spatial concepts' [in design]?

Fundamental Spatial Concepts

- symmetry / pattern / shape / motif / clustering /scale / rhythm / proportion / texture / axiality / form / concentricity / repetition / sequence, et al. (Lynch *Good City Form*, e.g.)

Spatial Prepositions

- are important in design and **spatial reasoning**: west-of, uphill, beside, along, surrounded-by, half-inside, in the lee of, …

What about:

- 'formal' / 'grand' / 'clear' / 'confusing' / 'serpentine' / 'human scale'

Are these spatial? Computable?

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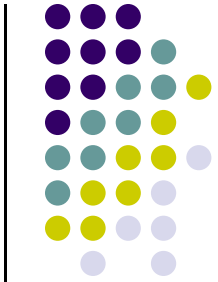
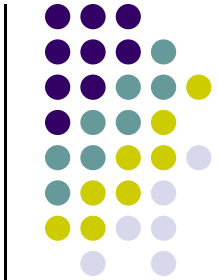
From Stephen Ervin's presentation (slide #2)



*To what extent can the fundamental **cognitive operations** of design be addressed with GIS?*

- **'Design' : carries a lot of baggage**
  - is it Art? Science? Problem-Solving?
- **What are its essential skills?**
  - Do material, scale, and subject/discipline matter?
- **What constitutes design education?**

Do you notice any difference between slide #1 and slide #2?



- Slide #1: design as **noun** (product)
- Slide #2: design as **verb** (process)

➔ *Two different challenges for us:*

#1: understanding with GIS the ***products*** of design

e.g., any landscape organized for human purposes

-> interpreting the application of spatial concepts on the landscape

-> a problem of *inferring* design-oriented thinking

#2: supporting with GIS the ***process*** of design

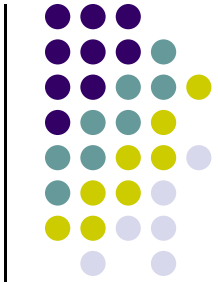
e.g., urban or ecological planning

-> supporting synthetic operations on spatial concepts

-> a problem of *facilitating* design-oriented thinking

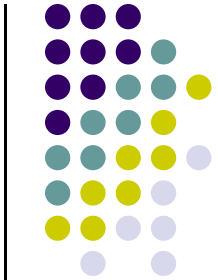
For now: let's focus on **Challenge #1**

Spatial concepts



- They are the same in analytic and synthetic thinking
- …but what you do with spatial concepts is different in the analytic and synthetic mode:
  - In **analytic** mode
    - you describe them; you investigate their properties
  - In **design** mode
    - you use these concepts and their properties to solve constraint satisfaction problems

The differences



- There are differences in emphasis:
  - Some concepts are more important in analysis or design
    - **Analysis**: pattern
    - **Design**: configuration, arrangement, structure, composition, design, motif, form, shape, etc. etc.
- There are differences in qualifiers:
  - Key objectives are different in analysis and design
    - **Analysis** objective: Correct representation
      - Qualifiers: data quality, accuracy, precision, fuzziness,…
    - **Design** objective: Fitness-for-use (practical, aesthetic)
      - Qualifiers: efficient, functional, harmonious, pleasant, symmetric, human-scale, ‘good’
  - *See Steve Ervin’s slide #1*

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Implications for GIS?...

Understand the Yin-Yang of Analysis and Design