Users, Tasks & Evaluation

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Visual Data Exploration
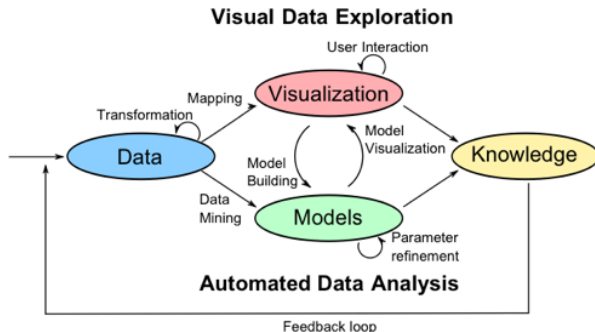
What is visual analytics?

Previously in CSCM27 (2)

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- What sorts of problems does visual analytics try and solve?
- What areas does visual analytics involve?
- What are the visualisation/visual analytics mantras? What do they mean?

- To begin our module we need to start at the end
- You need to understand the users before you build your system

Users, Tasks, & Evaluation

Thanks

- Huge thanks to Tamara Munzner (my PhD adviser)
- Many of the figures are from her work
- This lecture is based off of her lectures

Visual Analytics & Visualisation

- Everything starts with what the user wants to do
- Visual analytics started off in the visualisation community
- Many of its evaluation models and methods apply

T. Munzner, A Nested Model for Visualization Design and Validation in IEEE Trans. on Visualization and Computer Graphics, 15(6):921-928, 2009.

M. Sedlmair, M. Meyer, and T. Munzner. Design Study Methodology: Reflections from the Trenches and the Stacks. IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2012), 18(12):2431-2440, 2012.

Evaluation Should Fit Problem

From Tamara Munzner papers and slides

- Make sure that evaluation matches problem

Domain Situation

- What users are really doing out there
- The data the users possess
- What they want to do with it
- Several iterations of user-centred design needed
- Evaluation is based on uptake of the developed tool

Data/Task Abstraction

- Take the domain and divide into a generic representation
- Task blocks are designed in a domain-independent language
- Encodings are selected to support tasks
- Evaluation is qualitative observation of deployment

Visual Encoding/Interaction

- A new way of representing some information
- This new visual representation needs to be evaluated against state-of-art
- Can create/use new algorithms
- Evaluation measure human performance (can measure running time)
    - qualitative study of how people use it
    - formal study in lab with participants

Algorithm Work

- A algorithm that applies to multiple scenarios
- Motivated by a general solution to many problems
- Typically motivated by citing these problems
- Evaluation demonstrates that it is a more efficient solution
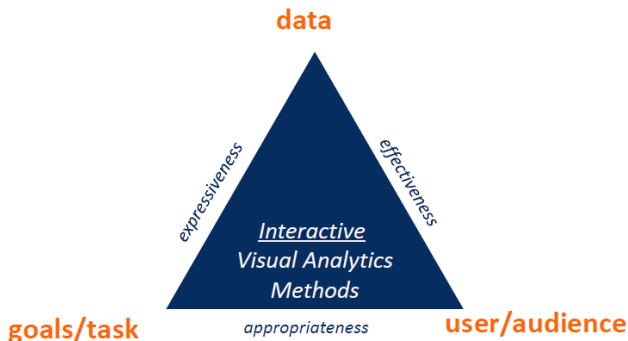   - running time and performance of algorithm measured

Algorithm -> Problem & Problem -> Algorithm
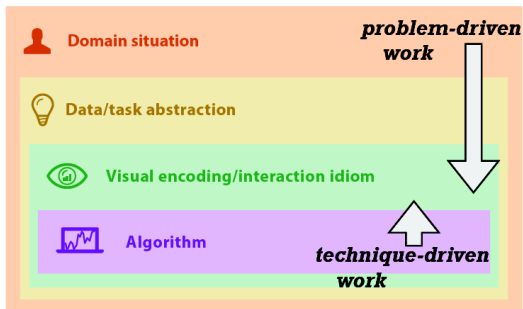
From Tamara Munzner papers and slides

- Technique needs to look outward
- Problem works needs to look inward

Visual Analytics: Silvia Miksch

data

expressiveness

effectiveness

Interactive
Visual Analytics
Methods

goals/task

appropriateness

user/audience

From Silvia Miksch

- Interaction between goal, data, and user

In Class Exercise: Problem Design

1. every 5mins for 1 year, temperature of water in Swansea Bay
2. Sequence of hospital procedure checks of 215 children admitted to emergency room. Events:
   - primary survey: airway, breathing, circulation, disability (event)
   - secondary survey to identify other injuries (interval)
3. Yearly popularity of baby names over 150 years