**Visualization Process and Collaboration**

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**Technique-driven work**
- 3D hyperbolic graphs
  - H3
- dimensionality reduction
  - scisVis
  - GPU accelerated
  - Glimmer
- general multilevel graphs
  - Layout
  - Interaction
  - Graphs, GraphVis, TugGraph

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**Problem-driven work**
- evolutionary tree comparison
  - TreeJuxtaposer
- protein-gene interaction networks
  - Cerebral
- linguistic graphs
  - Constellation

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**Collaboration**
- sometimes you approach users
  - not guarantee of success!
- challenges
  - learning each others' language
  - finding right people/problems where needs of both are met
- collaboration as dance/negotiation
  - initial contact is only the beginning
  - continuous decision process: when to end the dance?
    - after initial talk?
    - after further discussion?
    - after get feel wet with start on real work?
    - after one project?
    - after many projects?
  - domain problem characterization
  - big data
  - clear questions
  - need for human in the loop
  - enthusiasm/respect for vis possibilities
- left: providers of principles/methodologies
  - HCI, cognitive psychology
  - computer graphics
  - math, statistics
- right: providers of driving problems
  - domain experts, target app users
- middle: follow vis practitioners
- middle: follow tool builders, outside of vis
  - often want vis interface for their tools/ags
  - do not take their word for it on needs of real users

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**Characteristics I look for in collaborators**
- people with driving problems
  - big data
  - clear questions
  - need for human in the loop
  - enthusiasm/respect for vis possibilities
- all collaborators
  - has enough time for the project
  - research meetings are fun
    - no laughter is a very bad sign
    - (project has funding - ideally...)

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**Studies: different flavors**
- head to head system comparison (HCI)
  - H3 vs. 3D web browser
- psychophysical characterization (cog psych)
  - impact of distortion on visual search
  - on visual memory

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**Process model: what can go wrong?**
- wrong problem: they don’t do that
- wrong abstraction: you’re showing them the wrong thing
- wrong encoding/interaction: the way you show it doesn’t work
- wrong algorithm: your code is too slow

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**Second prototype**
- better linked views
  - solved interesting aggregation problem
- but not deployed
  - real goal was policy choices and behavior change
  - not to absorb details of how simulation works!
- got the task wrong!
Studies: different flavors

• characterize technique applicability, derive design guidelines
  – stretch and squish vs. pan/zoom navigation
  – separate vs. integrated views
  – 2D points vs. 3D landscapes

• requirements analysis (before starting)
  – semi-structured interviews
  – watch what they do before new tool introduced
  – current workflow analysis

• field study of deployed system (after prototype refined)
  – watch them use tool
  – characterize what they can do now