HCI/Geol/CS 558 X
Lecture 15
4/24/07

- Review

- Final on May 1, 9 am, this room
- Open book exam (textbook, slides, …)
- 12 Multiple Choice questions (15 min), worth 30%
- valid test material: lecture (lab 1&9) slides, quizzes and textbook (chapters we did only)
- exception: python stuff
- Practical part: 3 of 4 exercises (60 min), Dobler data, cloudwater data + new data set, one free form vis, part of network given, worth 70%

Review

- What is 3D scientific visualization? (1)
- Why use 3D scientific visualization? (2)
- Major steps in using 3D visualization? (2)
- Four major data structures ("how to connect data") used in DX? (3)
- Types of data attributes simplified Stevens' system (3)

- Vector data (magnitude, direction) vs. scalar data (3)
- Efficiency (simplicity of definition) of geometry? (3)
- Difference position dependent vs. connection dependent data ? (3) How does it look in the DX data model (lab 9)
- Isosurfaces: 2D/3D, iso-value(s) colored, transparency, multiple via list (3)
- How to make a 2D iso-lines (3)

- Rubber sheeting: 2D pos + “elevation” (4)
- Slab: orthogonal slices, integer steps, variable “thickness” (incl. 0) (4)
- Planes: defined by normal vector and its position (4)
- MapToPlane: plane with arbitrary position/ orientation showing data (4)
- Clip plane: defines halfspace where all data is clipped (cut away) (4)

- Animation: Sequencer: min, max, steps in ints (4)
- Glyphs: scalar/vector, size, color, reduce/interpolate positions (5)
- Streamlines: seeded particles, timesteps, trajectory simulation, color, tube (5)
- volume rendering: software, "autocolor", general theory (6)
- colormodels: RGB vs. HSV, opacity (6/7)
- Autocolor, color, colormap, colorbar, min/max (7)

- Variable selection from import: select (import)
- Captions, Autoscale "box", Axis
- echo, print, statistics, histogram, plot, showConnections, showPositions, showBox
- compute: 2 inputs, always uses data component!, a[0], a[y], "formula", vector, list: {a/2, 0, sin(a+b)}
- mark: turn positions (etc.) into data, saves "old data"
- unmark: turns "old data" back into data
- sample: decimate data

- include - min/max data filter (“exclude”)
- User interface modules: filename (fileSelector), sliders (scalar, vector), variable selection (selector)
- importing: DX file format (.dx) or .general (header file), reference to (binary) data, set grid parameters
- data model: position, connections, data, dep vs. ref
- Map module: “what data?”, “onto which positions?”
- Go over DX user’s reference - get a refresher on the modules we used

- Pre-attentive stages of perception:
  1) feature extraction
  2) pattern construction; very fast, parallel, effect: "pop-out" (8/9)
- Active attentive stage 3): visual queries, getting the gist, limited working memory, slow (8/9)
- 3D shape recognition: analog to computer graphics
- Based on light - material interaction: shading, specular highlights, shadows, texture, perspective

- High level model of human vision: only few objects, need attention, depends on task
- Uses temporary (sparse) pointers to visual objects,
- Change blindness research: pointers can be lost easily, need to be re-attended
- General: consequences for vis design ?

- See pdfs of slides on WebCT
- also: labs 1& 9, quiz 3 solution, no lect. 12
- Send me email questions you may have
- See you next Tuesday 9 am