HCl 558 - lab I

1-19-07
Data structures

- Scattered points
- point “cloud”
- location at x,y,z
- no connections between points
- each point carries information (data)
- example?
Regular grids

- connects (3D) points
- 90-degree-aligned along lines/planes
- 2D: pixels, 3D: voxels
- special case: elevation grid
- origin (in local or global coordinates) (where?)
- number of pixels in x y z dimension (N = number of)
- size of pixel in x y z dimension (d = delta)
- xyz point locations?
- example?
Deformed (regular) grid

- warped (topologically) regular grid
- same x by y by z cell scheme as regular grids
- but different cell locations!
- example?
Irregular “Grid”

- some form of connections between 3D points
- typically: only triangles
- surface mesh: TIN
- T: triangles
- I: irregular (no simple rule, topology
- N: network
- 3D “triangles”??
Data Dependency (regular grids)

• What is the data?
• How to fill space?
• Position dependent: rest of cell is interpolated
• Connection dependent: uniform cell value
• (also called node centered, think “pixels”)

Data Value

Data Value
Position dependent: (value only at corners)
Connection dependent: (uniform value “in-between")

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• Position dependent: The data sits at the positions (points)
• Visualize by interpolating data from “positions”
• Smooth colors
- Connection dependent
- The data is the connection in between
- no interpolation
- constant value within each cell
- Blocky colors

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Comment on the differences

When would you use which model?
What happened here?
Preparations for running dx

- login and bring up a terminal or a file manager
- type: `pwd` ; you are in `/home/<you>` (ASF drive? engineering home?)
- our hci558 “home” is in `/lockers/hci558`
- your student folder will be in `/lockers/hci558/students/<you>`
- folders also in `/lockers/hci558`
- data, (read-only for you!), DX_manuals, help (html help), tmp (scratch folder)
• dx is installed locally at: /usr/local/bin/dx
• some examples: /usr/local/dx/samples/data or /lockers/hci558/data/samples/data
• start dx: type dx into terminal (or dx &)
• See if it works: Import Data ...
• press ... box under “Data file name” to quickly get /usr/local/dx/samples/data (if not go to samples/data manually)
• In Data File Selection click on file in the left part
• for example: temperature.dx (use only .dx files for now!)
• Press Visualize Data ...
• Execute - Execute On Change,
• rotate view: drag left in 3D graphics window
• next lab: ch 3