Designing a Collaborative Cross-Campus Airport (or Other Transit) Simulation Project

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Our CPATH Effort

1. Enabling and fostering innovative change within the CS curriculum
2. Sharing knowledge and resources as innovation takes place
3. Enabling heightened outreach to K-12 schools
4. Integrating computational thinking into a variety of disciplines
5. Enabling heightened ability to evaluate new educational strategies

Wiki - portal

- http://ai.vancouver.wsu.edu/nwdcsd/wiki

- Calendar
- Module development information
- Approval of accounts

Goals

- Design a fun and educational cross-campus collaborative project composed of modules in different disciplinary areas.

- Offer students the opportunity to work within a large cross-campus collaborative community

Motivation

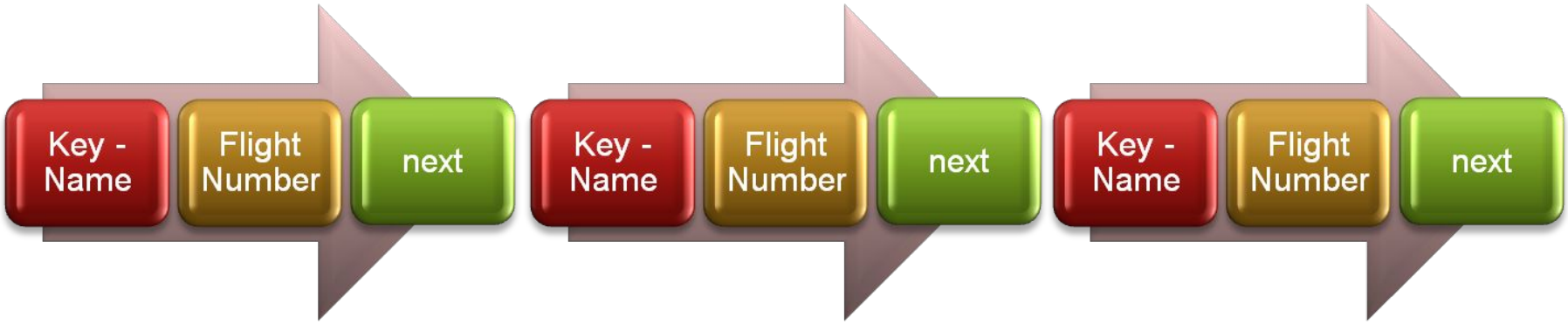
- We all teach in small colleges and we believe that students would benefit by working on a large project that incorporates a variety of interdisciplinary computing concepts
- By combining efforts and designing a large collaborative project, we believe that this could be achieved

Airport Problem

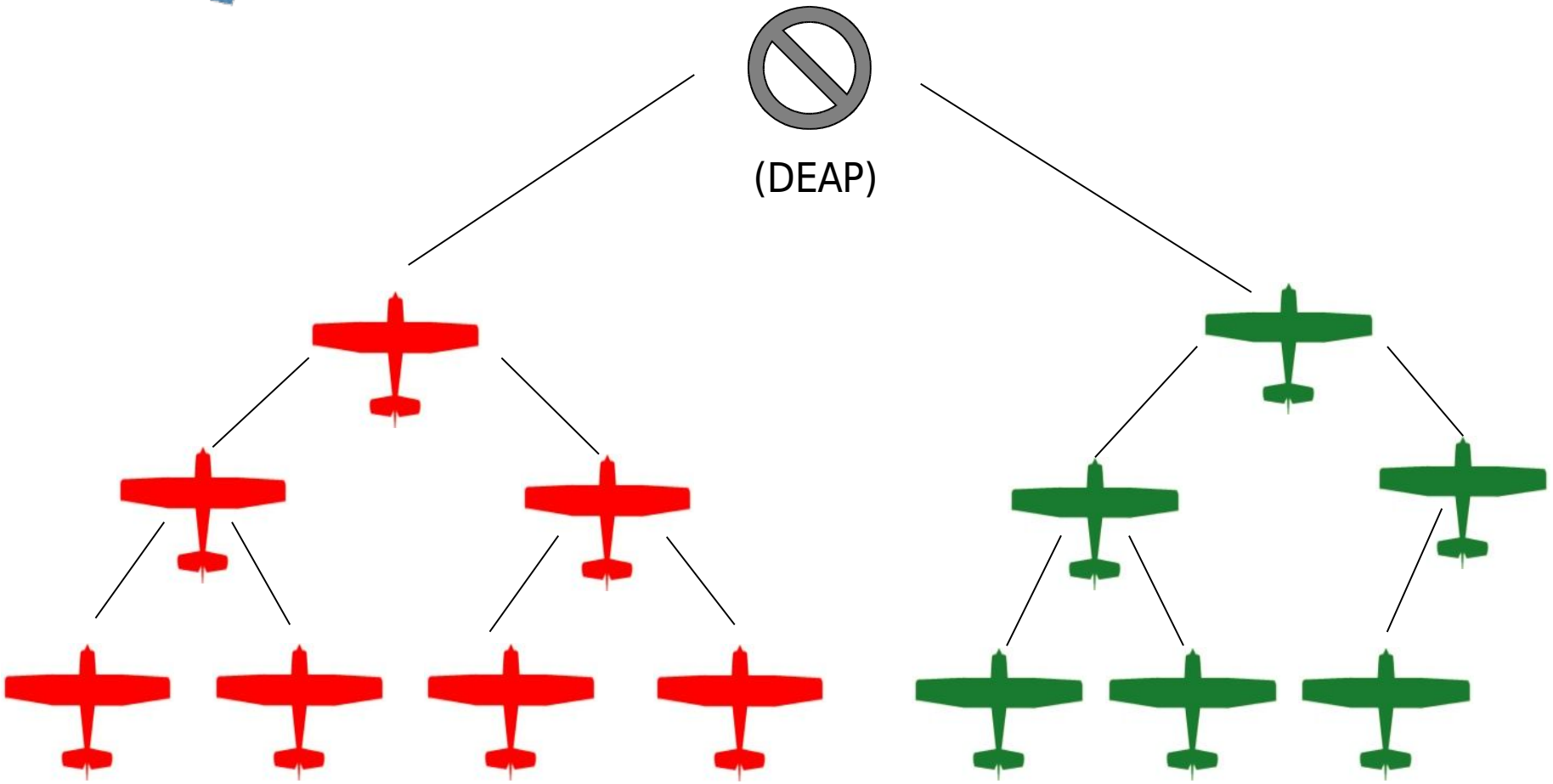
Using different algorithms that work in tandem to solve complex problems.

The Lobby

(Linked List)

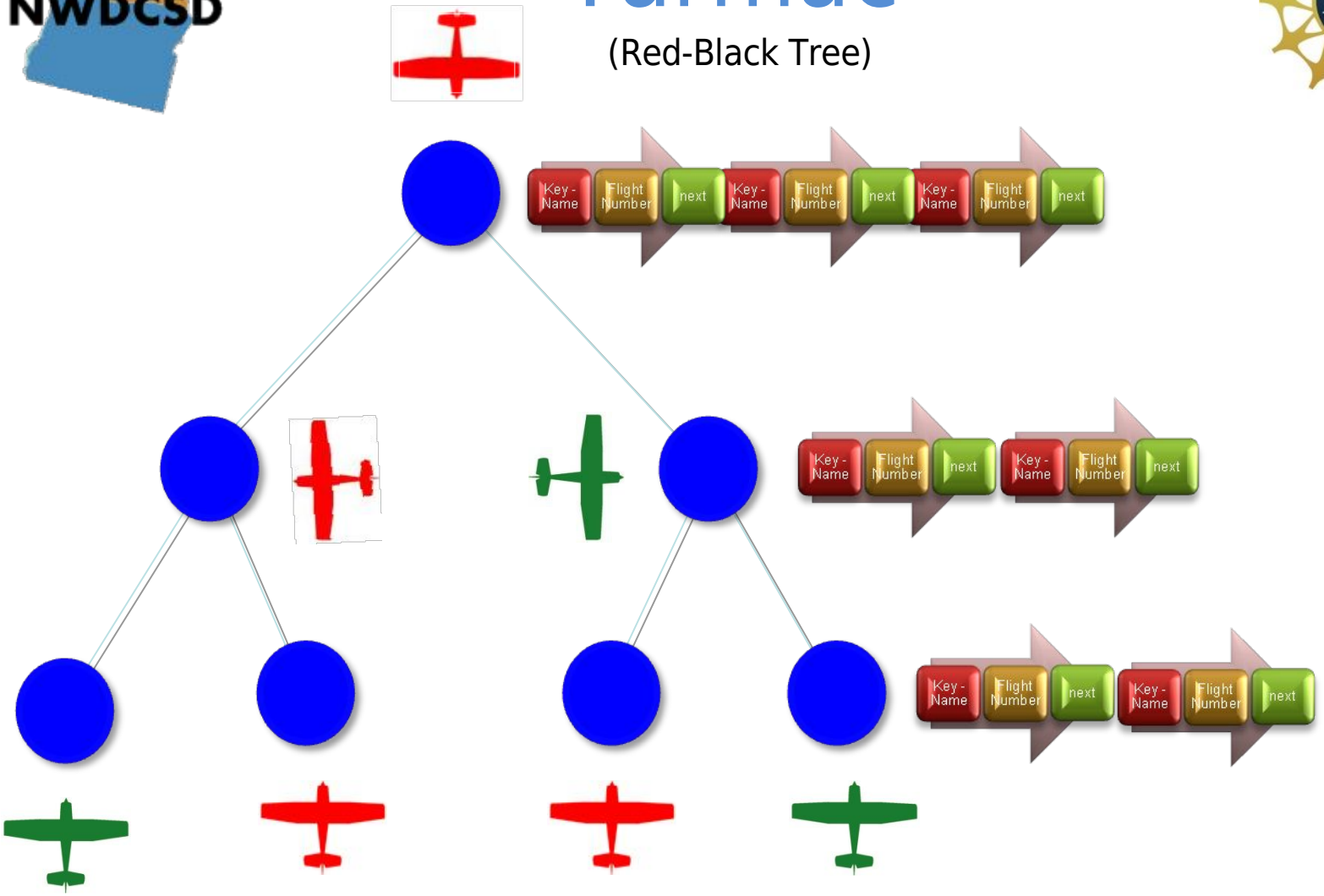


Airspace: Prioritize Landing Order



Tarmac

(Red-Black Tree)

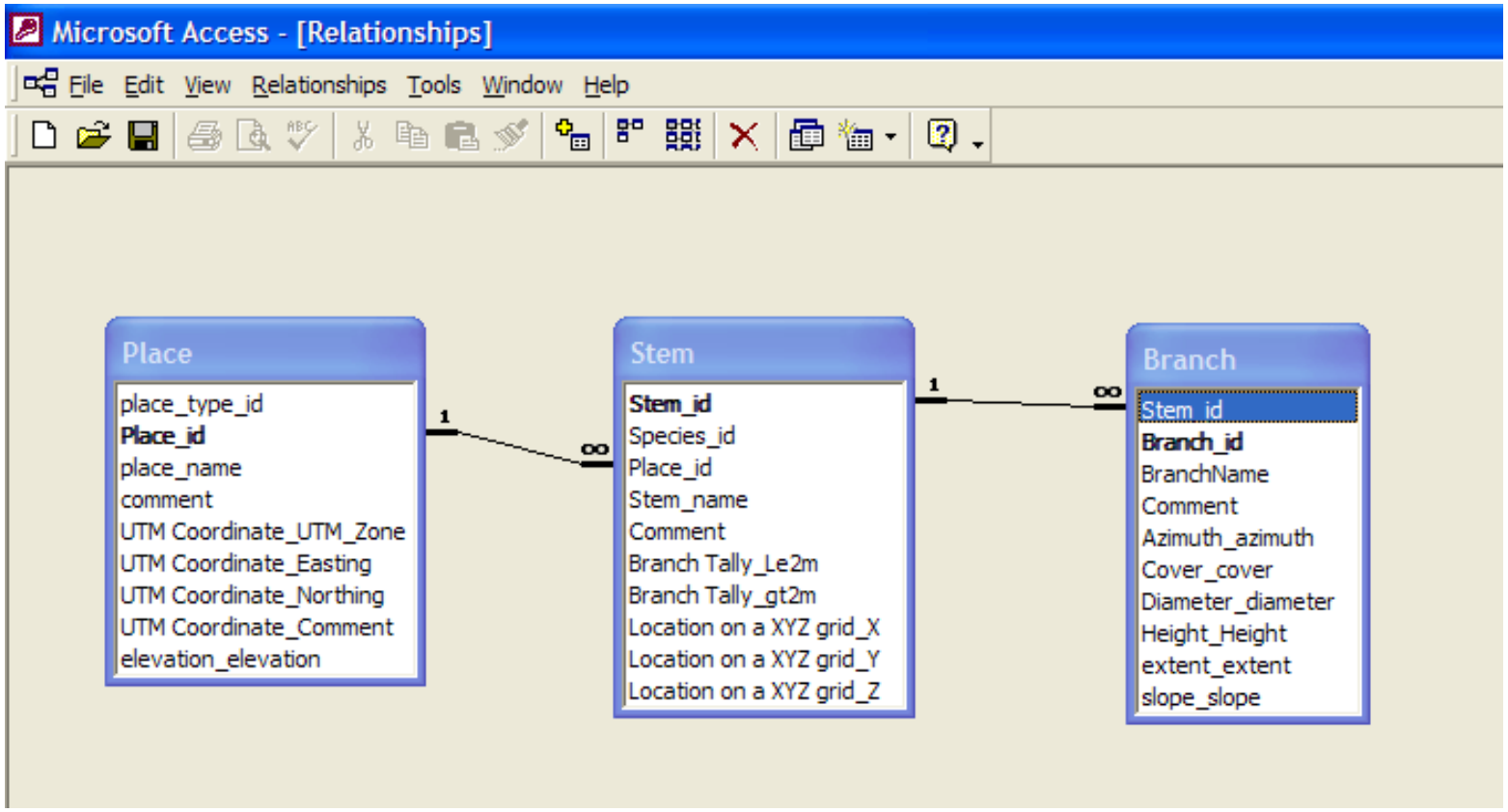


Airport Traffic Data

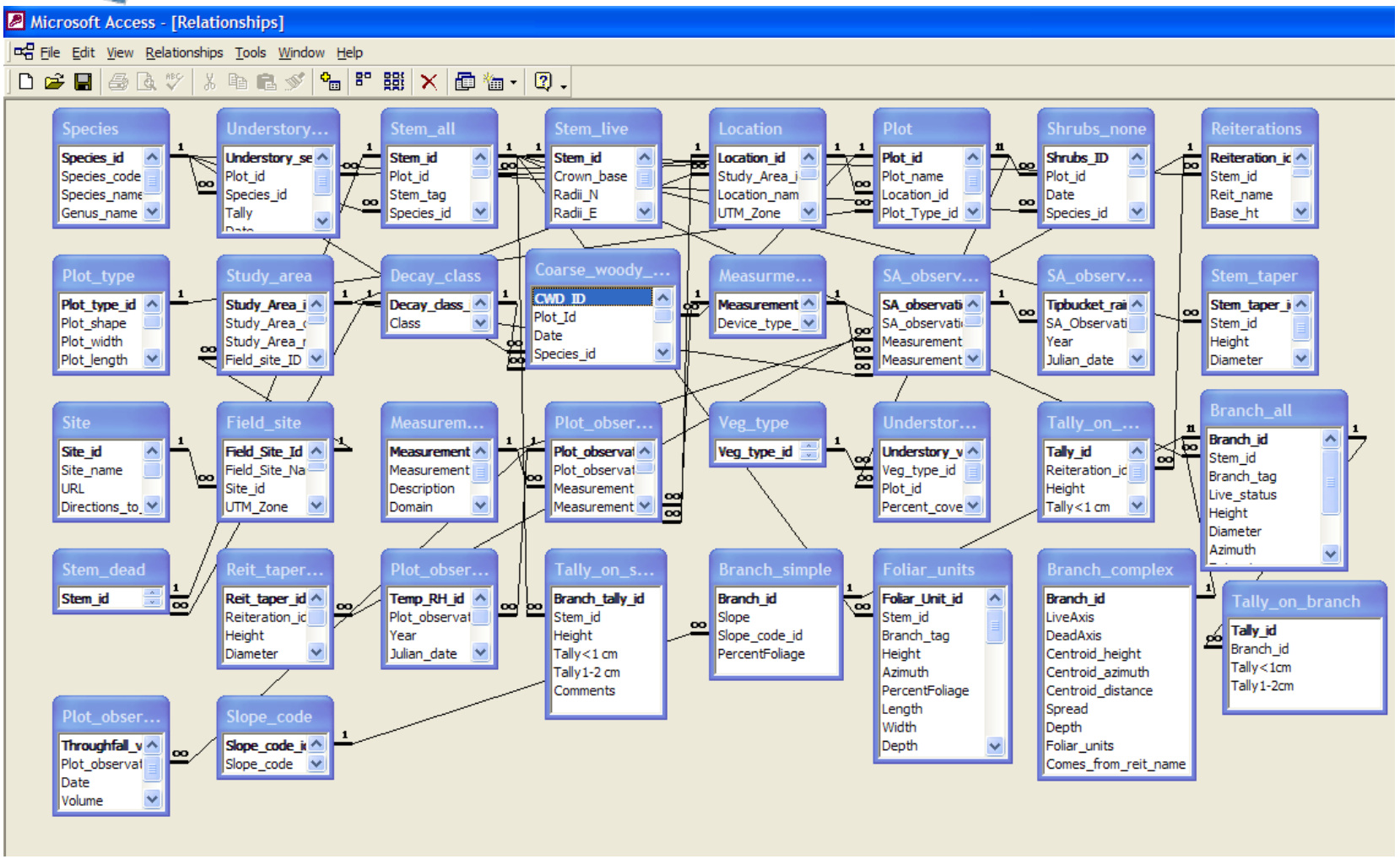
- AIRLINE_CODE AAL
- FLIGHT_NUMBER 268
- FLIGHT_TYPE_CODE COM
- DEPARTURE_STATION_CODE SEA
- ARRIVAL_STATION_CODE JFK
- FLIGHT_STATE_CODE A
- AIRCRAFT_EQUIP_CODE B752
- ACTUAL_TAKEOFF_TIME 8/19/2008 2:51:00 PM
- ESTIMATED_TAKEOFF_TIME 8/19/2008 2:51:00 PM
- SCHEDULED_TAKEOFF_TIME 8/19/2008 2:53:00 PM
- ACTUAL_LANDING_TIME 8/19/2008 7:29:00 PM
- PLANNED_LANDING_TIME 8/19/2008 7:38:00 PM
- ESTIMATED_LANDING_TIME 8/19/2008 7:29:00 PM
- SCHEDULED_LANDING_TIM 8/19/2008 7:37:00 PM

Canopy DB Project

- Database generation for field ecologists

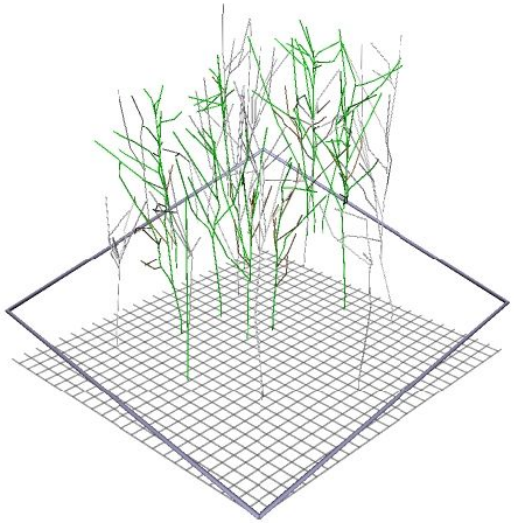


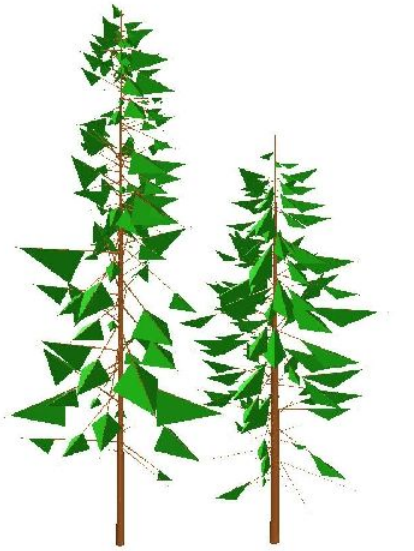
An Even More Complex Example (real world dataset!)



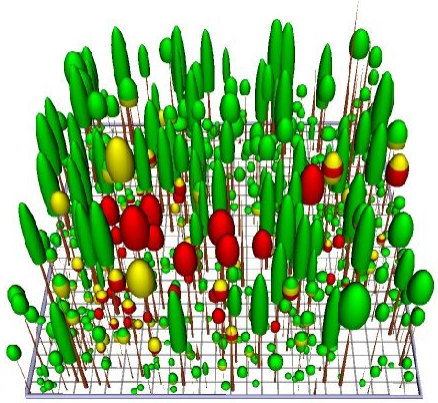
Canopy DB Project

- Database generation for field ecologists
- Visualization of real world phenomena



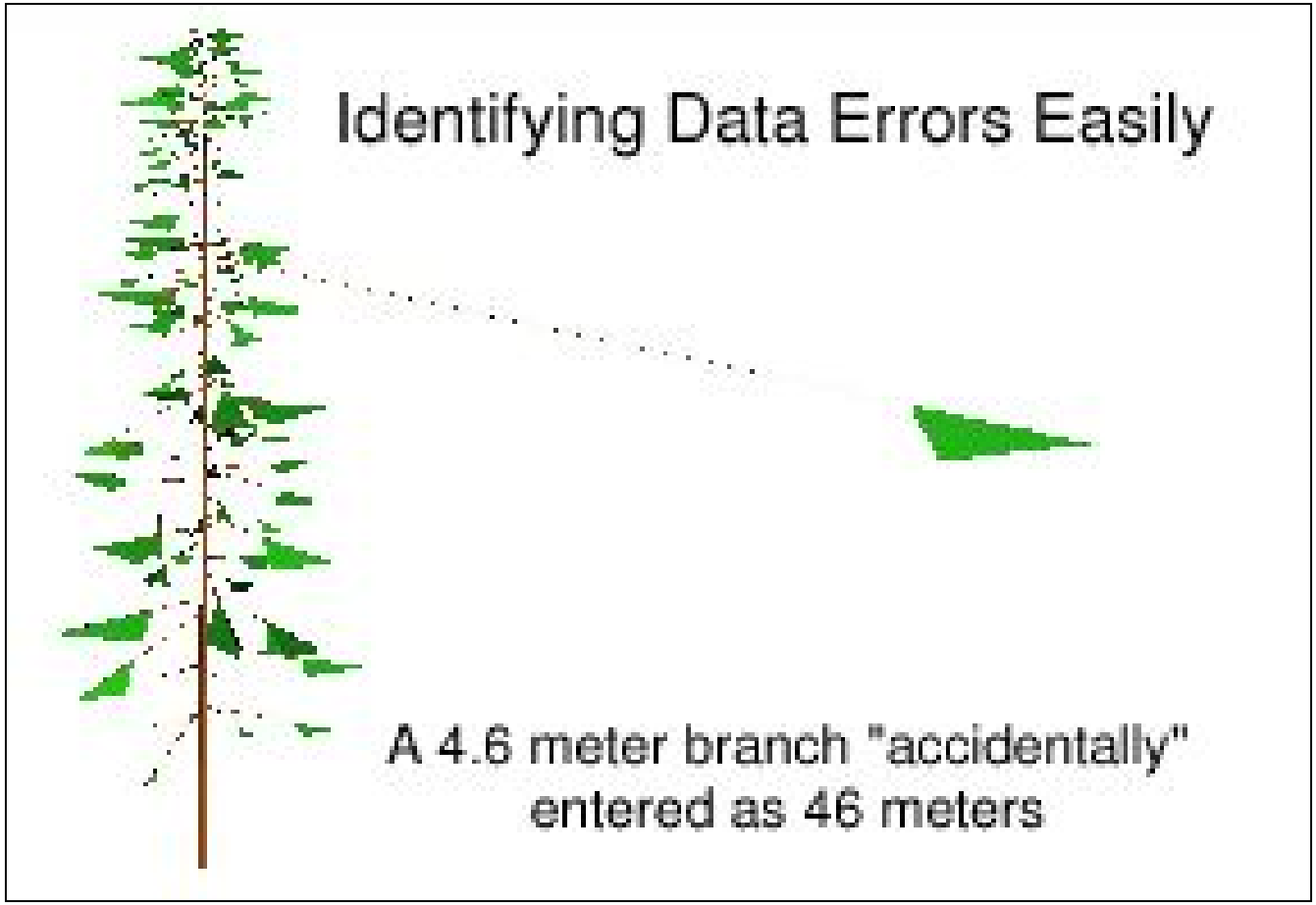


Van Pelt & Nadkarni 2004

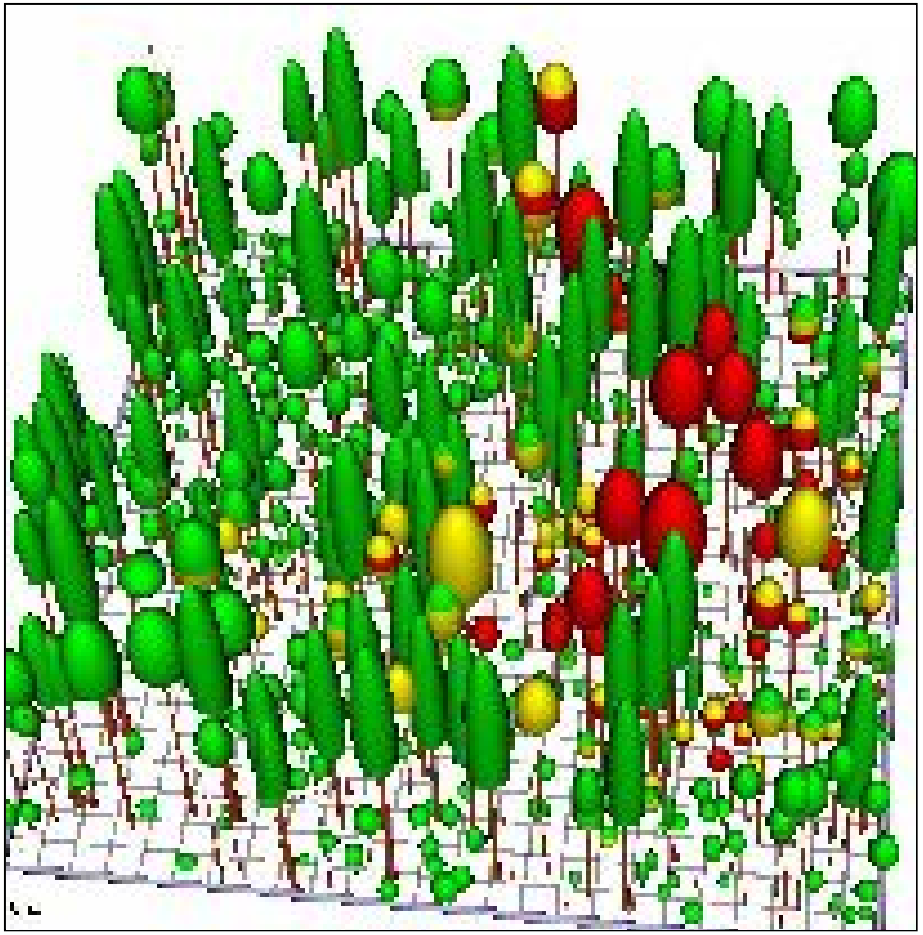


Shaw et al. 2005

Power of Visualization
Identifying Data Errors Easily



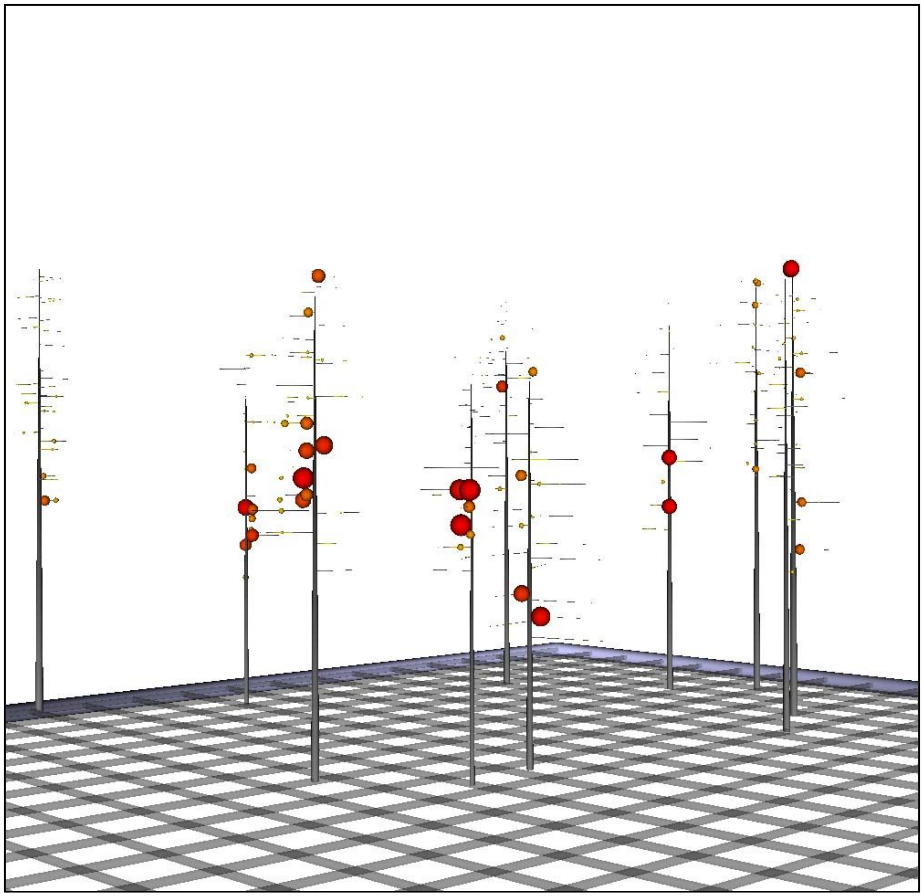
Power of Visualization
Identify Patterns



Shaw *et al.* 2005

Power of Visualization

Superimpose multiple observations
(e.g., epiphyte cover on structural information)



Possible Areas for Educational Modules

- Data Structures & Algorithms
- Scientific Databases
- Machine Learning & Simulation
- Graphics
- Human Computer Interfaces
- Networking
- Games
- Programming Languages
- other?

Action Items

- (Today) Volunteer to work on a module
  - ideally to use in a course you are teaching soon.
- Develop plan for the module.
- Specify timeframe for implementation and testing.
- How will collaboration take place.
- Plan to place work on wiki.