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

Pamela Dake  
Clark College  
PDAke@clark.edu

Robert Bryant  
Gonzaga University  
bryant@gonzaga.edu

Shereen Khoja  
Pacific University  
shereen@pacificu.edu

Jenny Orr  
Willamette University  
gorr@willamette.edu
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

(DEAP)
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_TIME: 8/19/2008 7:37:00 PM
Canopy DB Project

- Database generation for field ecologists

![Database diagram](image)

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Collaborative Project Panel
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

A 4.6 meter branch "accidentally" entered as 46 meters
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.