Lecture 4: Operational Logics

Kathleen Tuite
CM 148
ktuite@ucsc.edu
April 6, 2015
Expressive Processing: Digital media diagram

Audience(s) → Interaction

Surface

Data → Process

Author(s)

Interaction

Outside processes & data sources
Expressive Processing: Digital media diagram

- Audience(s)
- Interaction
- Surface
- Data
- Process
- Author(s)
- Outside processes & data sources
- Novelty
Introducing operational logics

• Operational logics are the abstract operations, supporting interpretation, that underwrite gameplay

• “Games tend to have a very narrow set of operational logics”
  – Ian Bogost and many others
Graphical logics

• Graphical logics are the abstract operations associated with movement, collision detection, and physics
  – underwrite the simulation of spaces and objects within spaces

• Movement – objects move in space
• Collision – object overlap triggers events
• Physics – movement governed by laws
Collision and movement logics
Physics logic
Navigation
Navigation
Resource management logics

- Resource management logics are the abstract operations associated with acquiring, using and transforming resources (e.g. food, money)

- Allocation – selecting sources, sinks and transformations to apply to a resource

- Random events – events within the fictional world that modify quantities or rate constants
Resource acquisition, allocation, transformation

TRY YOUR HAND AT GOVERNING ANCIENT SUMERIA
FOR A TEN-YEAR TERM OF OFFICE.

HAMURABI: I BEG TO REPORT TO YOU.
IN YEAR 1, 0 PEOPLE STARVED, 5 CAME TO THE CITY.
POPULATION IS NOW 100
THE CITY NOW OWNS 1000 ACRES.
YOU HARVESTED 3 BUSHELS PER ACRE.
RATS ATE 200 BUSHELS.
YOU NOW HAVE 2800 BUSHELS IN STORE.
LAND IS TRADING AT 26 BUSHELS PER ACRE.
HOW MANY ACRES DO YOU WISH TO BUY?
Resource allocation and random events
Formal model of resource logics

Machinations: Joris Dormans
Operational logics support playable model

• A playable model is a computational content model that is
  – Deeply responsive to audience activity
  – Supports incremental formation of actionable mental models

• Models move authoring to a meta-level
  – Still lovingly crafted, but not canned
Handcrafting limits interaction and gameplay

START
While digging for treasure in the desert, you find a door

dig some more

open it

This room has a chair in the middle. There is a door and a hallway here

go down hallway

Under the door, you find some stairs

go down stairs

open door

You find a room with a door, a long hallway, and a ladder going down

climb down ladder

open door

go down hallway

You find a room with a door and a ladder going up

climb up ladder

go through door

go back

The room has lava in it. You have to go back

open door

Yikes! The room has a giant spider in it. The room also has two doors

open left door

open right door

When you sit in the chair, treasure falls from the ceiling. You win!

sit in chair
Models escape the bonds of scripting

http://www.paperconsole.com/paperpong.html
Operational logics related to game engines

• We know how to do:
  – Physics
  – Collision
  – Navigation
  – Resource management

• Commonly provided by game engines

• Game author develops mechanics on top of these common operations
Assignment 2

• Pick a game to play for 8 hours

• Answer questions, e.g.
  – Describe the Listen -> Think -> Speak loop
  – What are the procedural and instandial elements?
  – Describe the operational logic(s)
  – ... and more!

• Due April 20 at beginning of class
Reading for Wednesday

• Chris Crawford’s Ch. 6 on Interactivity
  – From *Chris Crawford on Game Design*

• *Expressive Processing*, pages 103-107
Chris Crawford’s Dragon Speech

Game Developer’s Conference 1992

https://www.youtube.com/watch?v=kaBte1cBi5U