Computer Games Laboratory

Prototyping
Prototyping

Recommended Reading:

Chapter on Prototyping
Prototyping

• Why a prototype?
• “Creating a game without a prototype is like shooting a movie without a script.”

• A prototype adds more to a game than a script or doc can do:
  – Interactivity
  – Test and exploration
  – Modification
Prototyping

• Prototype
  – Something fast and cheap that allows you to answer a specific question about your game: “Is your game idea fun?”
    • Not something that eventually morphs into a game
    • Not something using the same technology as the production code
    • Not meant to impress others
    • Rather some form of scientific exploration
Prototyping

- **Prototype**
  - Only fundamental mechanics (formal elements)
  - Considers player(s) and the computer
  - Rough approximation of artwork and features
  - Focus on gameplay, abstract from production process
  - Extensible, instrument for radical changes
Prototyping

• The purpose of a prototype
  – Do not create a prototype to show something about the game
    • Rather validate or disprove some concept
    • Low effort
  – Test idea early on, before spending lots of effort on implementation
  – Prototypes don’t generate ideas, they validate them
  – Find upsides and downsides
  – Experiment, persuade and inspire …
Prototyping

• The purpose of a prototype
  – Define core gameplay elements in purest form
  – Learn whether core mechanics hold interest of players
  – Test e.g.:
    • Game mechanics
    • Balance of rules (too restrictive, too loose, too few, too many)
    • User experience
    • Embedded technologies
  – Discover play patterns and emergent behavior specific to your game
Prototyping

- Question to be answered by the prototype
  - A good question is concise and can be answered in a fairly unambiguous way
  - Ask yourself where you need understanding
    - Not necessarily full game
    - Focus on central gameplay component(s)
  - Can be about game design, or any other aspect of the game
    - How to make things look heavy by coloring
    - Can I control a pen via my iPhone
    - Does this sound bring me into the mood, etc.
  - Do not try to ask for a good game idea via a prototype
  - Decompose a big problems into smaller tractable ones
Prototyping

- **Measure the quality of a prototype**
  - Find relevant characteristics; interactivity, robustness, usability, beauty, performance, agility, and many more
  - Evaluate per characteristic quality/cost

![Diagram](image)

- suck
- ok
- good
- cool
- awesome

![Graph](image)
Prototyping

• How to generate a prototype
  – Look for the cheapest way to get it
  – Steal it or fake it
  – Use available tools
Prototyping

• How to generate a prototype
  – Let the designer set the problem, let the programmer understand the goal, work together to solve the problem
  – Which prototyping technique? Paper, storyboard, physical, software
  – Code is expensive, reduce cost & effort
  – Only spend code where you need understanding;
  – Don’t restrict your mental capabilities by code
  – Don’t care about robustness, code optimality, software engineering
  – If software, choose between rapid prototype and using a real engine
Prototyping

- Prototyping techniques
  - “Paper” / Physical prototypes
    - Good for testing game mechanics, quick to produce, but cannot convey game experience and action
  - Storyboard and animatics
    - Captures user experience, useful for communicating ideas
  - Software prototypes
  - Hardware prototypes (i.e., manufacturing processes)
Prototyping

• Physical prototypes - Step 1: Foundation
  – Design the basic game objects and mechanics
    • Cards, paper, pens, toys etc.
  – Test your game idea
  – Restrict yourself to the fundamentals; Don’t try to be too detailed
Prototyping

- Physical prototypes - Step 1: Foundation
  - Example: first-person shooter
  - Core gameplay: simultaneous action
  - Accomplish with action cards
Prototyping

- Physical prototypes - Step 2: Skeleton
  - Prioritize what is most essential and refine
    - Number of spaces player can move
    - Procedures for turning
    - Hit and miss rules for shooting
  - Build upon foundation with structure to support essential parts of game
    - Scoring system
    - Hit points
Prototyping

• Physical prototypes - Step 3: Formal Details
  – Add rules and features for a fully functional fun game
  – Focus on most important formal elements
    • Is objective interesting and achievable
    • Is player interaction ideal
    • Are there missing rules

  – Test each rule individually to determine if it is critical or not
    • Hit percentage, health scoring,…
Prototyping

- Physical prototypes - Step 4: Refinement
  - You have a playable system
  - Play, tweak, play, tweak, play, tweak,…
  - Question smaller and smaller details
  - Especially: Is the game fun?
  - Add new features one at a time
Look ahead: next steps

• Mutual project critiques on the wiki until Friday (May 15th)
  – Each team member separately for all other game ideas
  – What is your favorite aspect of the proposed game? Why?
  – What is your least favorite aspect? Why?
  – Which single change/addition would you suggest to most improve the game?

• Build a paper prototype for the next milestone (May 23rd)
  – Present changes to your game idea after the feedback
  – Explain your paper prototype and show a demo of its gameplay

• Afterwards implementation phases start!