Adapting Game Mechanics with Micro-Machinations

Seminar Automated Game Design
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Joint work with
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Workshop

• Goals
  – Share information about Micro-Machinations
  – Demonstrate interactive game adaptations
  – Think about practical applications
  – Discuss limitations
  – Discuss future directions
Workshop Strategy

Steps

Disciplines

Artifacts

Problem

Objectives

Gameplay Design

Gameplay Goals

Approach

Mechanics Modeling

Mechanics Model

Validation

Play Test

Aesthetics Feedback

Game Software
AdapTower: Workshop Case

- Prototype game in the Tower Defense genre
- Embeds the MM Library
  - Written in C++ ‘platform independent’
  - 3-clause BSD License
    github.com/vrozen/MM-Lib
- Example demonstrates how MM can be used to adapt game mechanics → gameplay
AdapTower: Gameplay Design

• Creeps spawn into the world

• Two kinds of buildings
  – Towers
    • kill creeps
    • produce essence
  – Bases
    • catch essence
    • produce gold

• Players can spend gold
  – Start with 120 gold
  – Buy a tower for 20 gold
  – Buy a base for 50 gold

Early Game Mechanics Sketch
AdapTower: Mechanics Modeling

- Creeps spawn into the world

- Two kinds of buildings
  - Towers
    - kill creeps
    - produce essence
  - Bases
    - catch essence
    - produce gold

- Players can spend gold
  - Start with 120 gold
  - Buy a tower for 20 gold
  - Buy a base for 50 gold
AdapTower: Mechanics Modeling

Let’s count the number of creeps, towers, bases, essence and gold

Visual Micro-Machinations run-time state
AdapTower: Play Testing

• Group Assignment 1
  – Play test the game together.
  – Do you see problems with the gameplay?

• Perceived Problems
  – Players set up towers and bases and then have to wait
  – Unexciting experience
AdapTower V2: Mechanics Modeling

- **Objectives**
  - Make positioning of towers important and speed up end-game

- **Group Assignment 2**
  - Model Mechanics modifications together.
  - Add a feedback loop to Towers such that towers gain experience (xp) based on kills and provide a bonus to range, firePower and rotationSpeed
  - **Hint:** pools and resource connections are at the top of the cheat sheet
AdapTower V2: Mechanics Modeling

- Possible solution
  - Add pool xp
  - Add a resource connection between killCreep and xp
  - Modify range adding an expression
  - Modify firePower adding and expression
  - Modify rotationSpeed adding and expression

Visual Micro-Machinations of the Tower Definition
AdapTower: Play Testing

• Group Assignment 3
  – Play test the game together.
  – Do you see problems with the gameplay?

• Perceived Problems
  – Towers easily become too strong
  – No interesting choices
  – All towers act alike
  – Unexciting experience
AdapTower V3: Mechanics Modeling

- **Objectives**
  - Allow players to choose spending xp specializing towers in different ways

- **Group Assignment 4**
  - Adapt the mechanics model together.
  - Add user upgrades for range, firePower and rotationSpeed spending xp
  - **Hint:** use interactive nodes

Visual Micro-Machinations of the Tower Definition
AdapTower V3: Mechanics Modeling

• Possible solution
  – Remove the xp bonus to range, firePower and rotationSpeed
  – Add converters upgradeRange, upgradePower, upgradeSpeed
  – Add resource connections from xp to the converters specifying the costs
    • The costs increase!
  – Add resource connections from the converters to the pools specifying the gain
    • The gains are constant.
AdapTower V3: Play Test

• Group Assignment 5
  – Play test version 3 of the game together.
  – Do you see problems with the gameplay?

• Perceived problems
  – None, it’s a perfect game!
  – No wait…
Concluding slide: What’s next?

• Free adaptations
  – Do you have ideas to make the game fun?

• Discuss applicability MM
  – Think about practical applications
  – Discuss limitations
  – Discuss future directions
    • Mixed-initiative model-driven game design

• Questions?
AdapTower: Other ideas

- Adding hitpoints
- Adjusting the fire rate
- Selling a tower
- Modifying the amount of essence generated

- Modifying Base