

CS 395-22

Computer Game Design

Introduction

Ken Forbus

Spring 2002

Who we are

- Instructor: Ken Forbus
- Teaching Assistant: Robin Hunicke



Top 10 reasons to take Computer Game Design

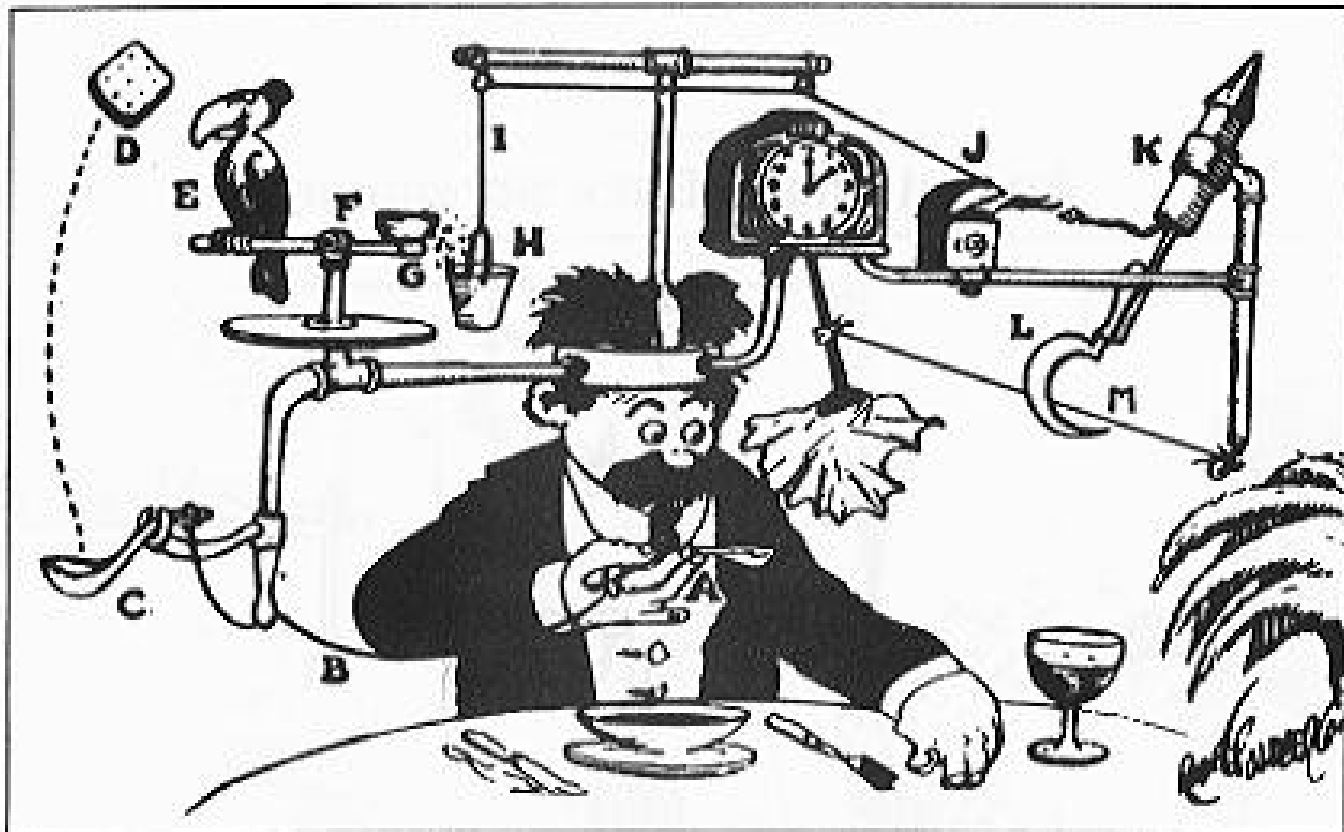
10. Writing the great American novel is passe
9. Longing for god-like power over others, even if they are only bits on a screen
8. Implementing Quake in Scheme48
7. Always wanted to build my own lifeforms
6. Finally put that linear algebra to use

Top 10 reasons to take Computer Game Design

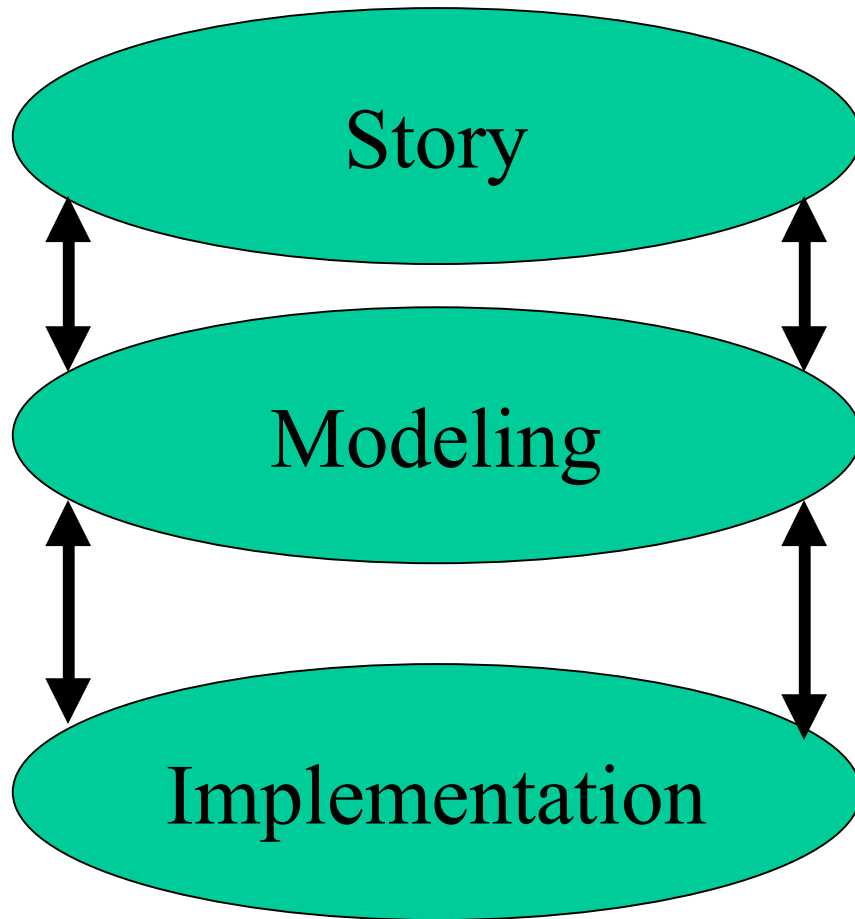
5. Designing games beats working for a dot-com as a way of making a living
4. The guest lectures
3. The 8am section of EA3 was full
2. Any course where the project work can include deathmatches can't be all bad.
1. Gosh darn it, it's going to be lots of fun!

Warning: This course is in pre-release Beta!

Self-Operating Napkin



One way to think about game design



How you want the player to think about the game; plot, activities, ...

What sorts of things do you need to support the Story?

How can you implement the world specified by the Model?

Focus: Game *Design*

- Heavily focused on story, modeling aspects
 - Little on implementation per se
- Some key questions:
 - What makes games fun?
 - How do we design software games that are fun?
 - How do the available technologies shape our designs?

Syllabus

- Text-based interactive fiction
 - Focus on plot, narrative, characters
 - Gentle introduction to art of modeling
- Game mechanics and tuning
- Game AI
 - Creating plausible computer players
 - Strategies for resource management and dealing with the physical world.
- World modeling and simulation
 - How to create believable worlds

Interactive Fiction

- Text-based
 - Relies on player's imagination
 - One of the earliest computer game genres
- Excellent tool for learning game design
 - Focus is on story and characters
 - Modeling is simpler than other genres

Interactive Fiction Tools

- Frotz interpreter
 - Plug-compatible with classic Infocom games
 - Has been ported to many platforms
- Inform compiler
 - Produces Infocom-compatible games
 - Object-oriented language with libraries specialized for interactive fiction

Game mechanics and tuning

- Sources of immersion
- Reward schedules
- Pacing

Game AI Design

- Creating worthy opponents for your players
- Strategies for dealing with the physical world
- AI design = Final frontier for game design & technology
 - Graphics on its way to be solved
 - Physics, too
 - Developing smarter characters will expand the range of games and lead to new genres

Tools: TBD



Jane's
Attack
Squadron

Age
of
Empires

Tank
SOAR

Simulation and World Modeling

- How do you create believable worlds?
- Sources of richness
- Fidelity/Fun tradeoffs



Tools: The Edith Object Editor

- How to build new objects for a rich interactive simulation environment

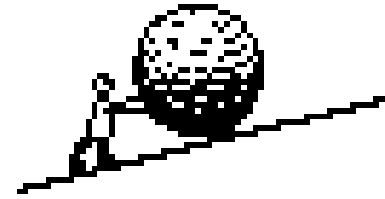


Grading

- 50% term project,
50% homework
- No incompletes
- Homework must be turned in via email
C95-GD-staff@cs.northwestern.edu
- ASCII body, with attachments as necessary
- Penalties for late homeworks TBD



Term Project



- Design and implement something playable
 - Mods and use of existing game engines *strongly* encouraged.
 - Teams of 2-3 people
 - It has to work and be playable by the end of the quarter
 - It has to run on the machines in the undergraduate lab, or machine(s) you provide
- End-of-quarter gaming party instead of final exam
 - June 7th, 5pm – 9pm (Friday before Finals week)
 - How your game plays and is enjoyed at the party is input for grading

Main constraint on term projects

- It should be something that you really want to play
- Use your imagination...but make it work!
 - You will be generating project plans, progress reports, and project presentations
 - We want you to succeed!

Term Project resources

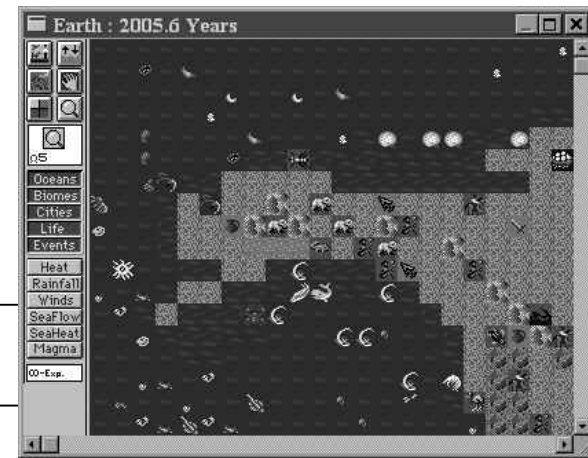
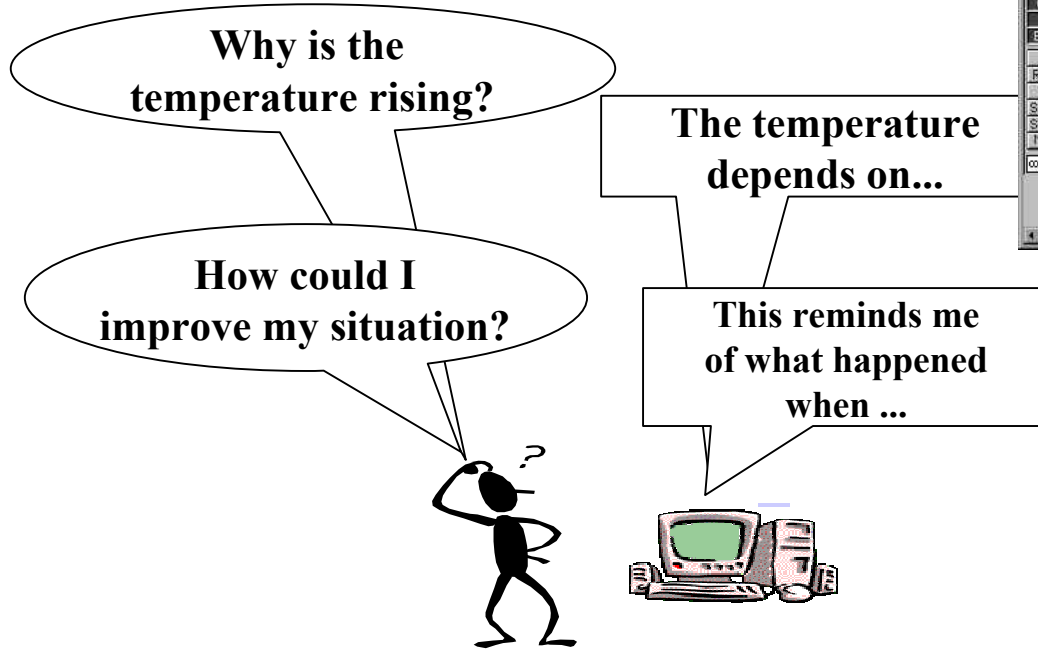
- Materials gathered from various sources will be available
- You'll be each other's play testers
- We have some in-house tools/development efforts you may be interested in...

Neverworld Three

- Open-source 3D multiplayer game development environment
- Scheme48 layer over OpenGL, DirectX system
- Under development at Northwestern



Articulate Game Engines



- Idea: Game engines incorporating conceptual, qualitative understanding of game world
 - Provide richer explanations and summarizations for coaches, tutors, opponents – game AI's can share underlying conceptual model
 - Automatic compilation of simulation engines from higher-level models, using *self-explanatory simulators*
 - Reusable domain theories and knowledge bases for creating new simulation worlds more quickly

Homework One

Due April 11th

- Please see the course web site for details