Game Design Process

EECS 494

9/20/06 by J. Laird and Sugih Jamin

Drawn from a talk by Ernest Adams – 9/16/2003

Buy his book: “On Game Design” by Andrew Rollings and Ernest Adams

Idea for a Game

- Most games begin with a single idea
- Idea can revolve around
  - A character [James Bond]
  - Gameplay/genre [A twitch FPS, a RTS game, …]
  - A sport [Football, Baseball, Snowboarding, …]
  - A story/quest/goal [A time-travel adventure]
  - A new technology [Motion capture of pro basketball players]
- Idea may be original, old, or hybrid
  - The Sims, Civilization, …

Inspiration

- Make a game about a story you've written
- Mix existing ideas from other games
- Steal ideas (but not characters) from other media: books, movies, comics, ...
- Market research: surveys, focus groups, …
- Take a current idea and do it better:
  - Better technology - graphics, sound, AI, ...
  - Better story
  - Different environment
- Brainstorm, throw out lots of ideas

Sid Meier

"I find it dangerous to think in terms of genre first and then topic. Like, say, 'I want to do a real-time strategy game. OK. What's a cool topic?' I think, for me at least, it's more interesting to say, 'I want to do a game about railroads. OK, now what's the most interesting way to bring that to life? Is it in real-time, or is it turn-based, or is it first-person, …'"

Ernest Adam's View on Game Design

- Computer games exist to fulfill dreams
  - Dream a dream. Then think of what it would be like to live it
- Dream of Being Someone Else
  - President of the United States
  - A Movie Director
  - An Olympic Skater
  - A Rock Climber
  - The World's Greatest Programmer
  - A University Professor
- Not all games fit this…

Interactivity is the raison d'être of Computer Games

- Ask **"What is the player going to do?"**
- This question comes before all others
- Do not get sidetracked with story, character, core mechanics, artwork, or ANYTHING else until you know the answer to this question

Inside-Out Approach

- DON'T begin at the beginning. Begin inside & work out
- Start with the primary *gameplay mode*
- Define that mode, then move on to others
  - Player's role
  - Interaction model
  - Perspective
  - Setting
  - Challenges the player confronts
  - Mechanics that create those challenges
  - Actions the player takes to overcome them
- Create supporting material later
  - It is always easier to fix the story, UI, etc. than to fix an uninteresting or unplayable game.

The Player's Role

- Who is the player trying to be?
  - Critical for representational/realistic games
- In single game may have multiple roles/multiple modes
  - Football – manager, coach, player
- If you can't describe it clearly, it will be confusing for the player

Interaction Model

- As an avatar
  - A single character or object that represents the play
  - Player's actions are limited to the avatar's location
- Omnipresence (but not necessarily omniscience)
  - Player can act in many or all places in the world
  - Chess is an obvious example
  - Not omniscience: e.g., fog of war

Perspectives

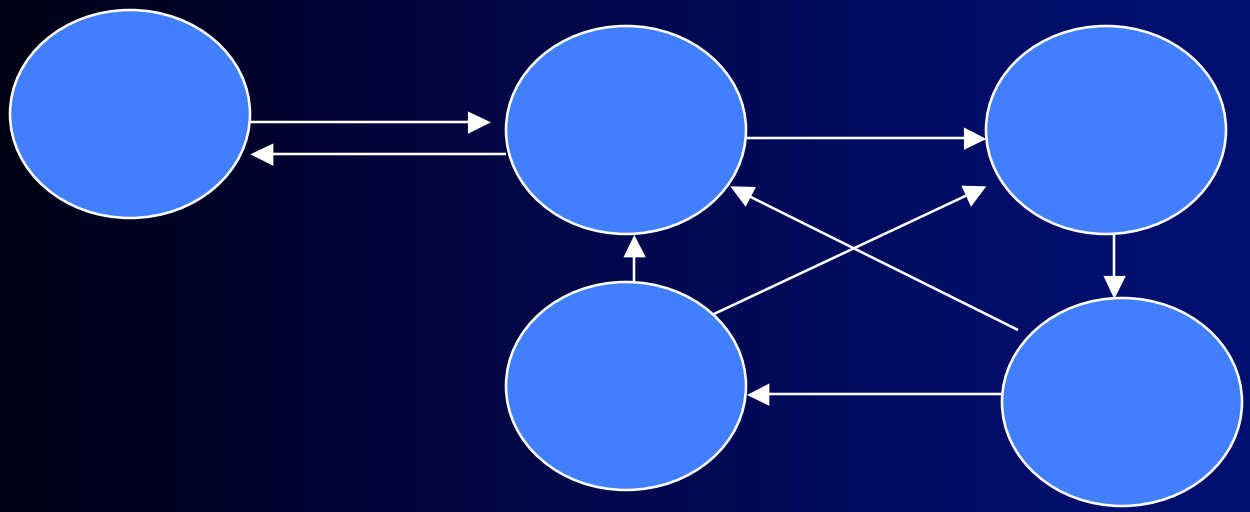
- First-person
  - Doom, Quake, …
- Third-person
  - Tomb Raider
- Side scrolling
  - Sonic
- Aerial – isometric/top-down
  - Isometric: Starcraft, Football
  - Top down: Total Annihilation
- Context sensitive
  - Resident Evil

Example of Multiple Game Modes

- Dungeon Keeper
  - Management – isometric, omnipresent, strategic
  - Map mode – top-down, omnipresent, few actions
  - Possession – first-person, avatar, tactical
- Soccer
  - Management - FIFA
  - Play calling – isometric, omnipresent, strategic
  - Play execution – isometric/first-person, avatar, tactical
- Sid Meier's Pirates!
  - Sea/islad map: isometric, omnipresent, strategic
  - City map: top down, omnipresent, stealth
  - Duel/Dance: first person, avatar, tactical

Game Structure

- The relationship between modes
- Some entered by explicit choice
- Some entered as part of natural progression
- State diagram:



Game Setting Dimensions

- Physical
- Temporal
- Environmental
- Emotional
- Ethical
- “Realism” (Abstract vs. Representational)

The Physical Dimension

- Dimensionality
  - 2-D, 3-D, 4-D (multiple 3-D spaces)
  - Don’t choose 3-D just because it is *cool!*
- Scale
  - How big is the world?
  - How big are things relative to each other?
- Boundaries
  - What happens at the edge of the world?
  - Does it harm suspension of disbelief?

The Temporal Dimension

- Is time meaningful?
  - Does the passage of time *itself* change the game?
  - Can be merely cosmetic
- Real time or turn based?
- Variable time
  - In *The Sims,* time speeds up while people sleep
- Anomalous time
  - Time goes faster for some things than others
- Can the player adjust time?
  - Often seen in flight simulators and RTS games

The Environmental Dimension

- Cultural context, in the anthropological sense
  - Beliefs, attitudes, values, social systems, family structure, key ceremonies and rituals, history
- Physical surroundings
  - Landscape, flora, fauna, weather, manmade items: buildings, vehicles, clothing, weaponry, furniture, art
- Level of detail
  - What can the player see? What can the player touch?
- Graphical Style
  - Style of the setting, but also style of your depiction

The Emotional Dimension

- Emotions of characters within the game
- Emotions you hope to inspire in the player
- Most games are not emotionally subtle
  - Emotions limited to “Yahoo!” and “Damn!”
- Consider others:
  - Jealousy, grief, anger, greed, disdain
- *How* will you inspire these emotions?

The Ethical Dimension

- In passive entertainment, viewer bring their own ethical system to the work
- In interactive entertainment, we give them one
- The victory condition defines what is "good"
- Players must conform to our morality to win
- Games get into trouble under two conditions:
  - A game is highly representational of the real world AND
  - Its ethics are highly disjoint from the real world
  - It is OK to kill aliens and robots realistically
  - It is OK to kill people unrealistically
  - but …

Types of Challenges

- Physical Challenges
  - Speed and reaction time (twitch games)
  - Accuracy and precision (steering and shooting)
  - Timing and rhythm (dance games)
  - Learning special moves (fighting games)
- Races – achieving something first
- Logical challenges (puzzles)
  - Should be based on an underlying principle
  - Trial-and-error solution is a sign of bad design
- Exploration Challenges
  - Locked doors and traps
  - Mazes and illogical spaces
  - Teleporters

Types of Challenges - 2

- Conflict
  - Strategy, tactics, and logistics
    - Logistics (food for armies) is rarely used
  - Survival and reduction of enemy forces
  - Defending vulnerable items or units
  - Stealth
- Economic Challenges
  - Accumulating wealth or points
  - Efficient Manufacturing
  - Achieving balance or stability in a system
  - Caring for living things within a system
- Conceptual Challenges
  - Understanding something new
  - Deduction, observation, interpretation
  - Detective games offer conceptual challenges

Core Mechanics

- Define the internal economy of the game
  - Most games have an internal economy
- Economy of a FPS
  - Resources: ammunition, hit points
  - Sources: clips, medical kits
  - Drains: firing weapons, being shot by enemy
- You *balance* the game by adjusting these numbers

Balance

- The process of making the game:
  - Fair – all players must have a equal chance of winning at start
  - Challenging, but not overly
    - Not too hard nor too easy
  - Winnable – the game must end sometime
- Symmetry is the simplest way to balance
  - Chess, most deathmatch games, …
- Asymmetry is harder but more interesting
  - Starcraft, Warcraft, …

Positive Feedback

- An achievement that makes subsequent achievements easier
  - Taking an opponent's piece in chess
  - If you got to *use* his piece as your own, it would be easier still
- Without positive feedback it is too easy to get stalemate
- Must be controlled to avoid giving the lead player too much advantage

Examples of Positive Feedback

- Get ahead in a race, more likely to get power-ups or special scores
- In Monopoly – get houses, more likely to get even more money
- Churned up water in swimming races slows down followers
- What about single-player games?

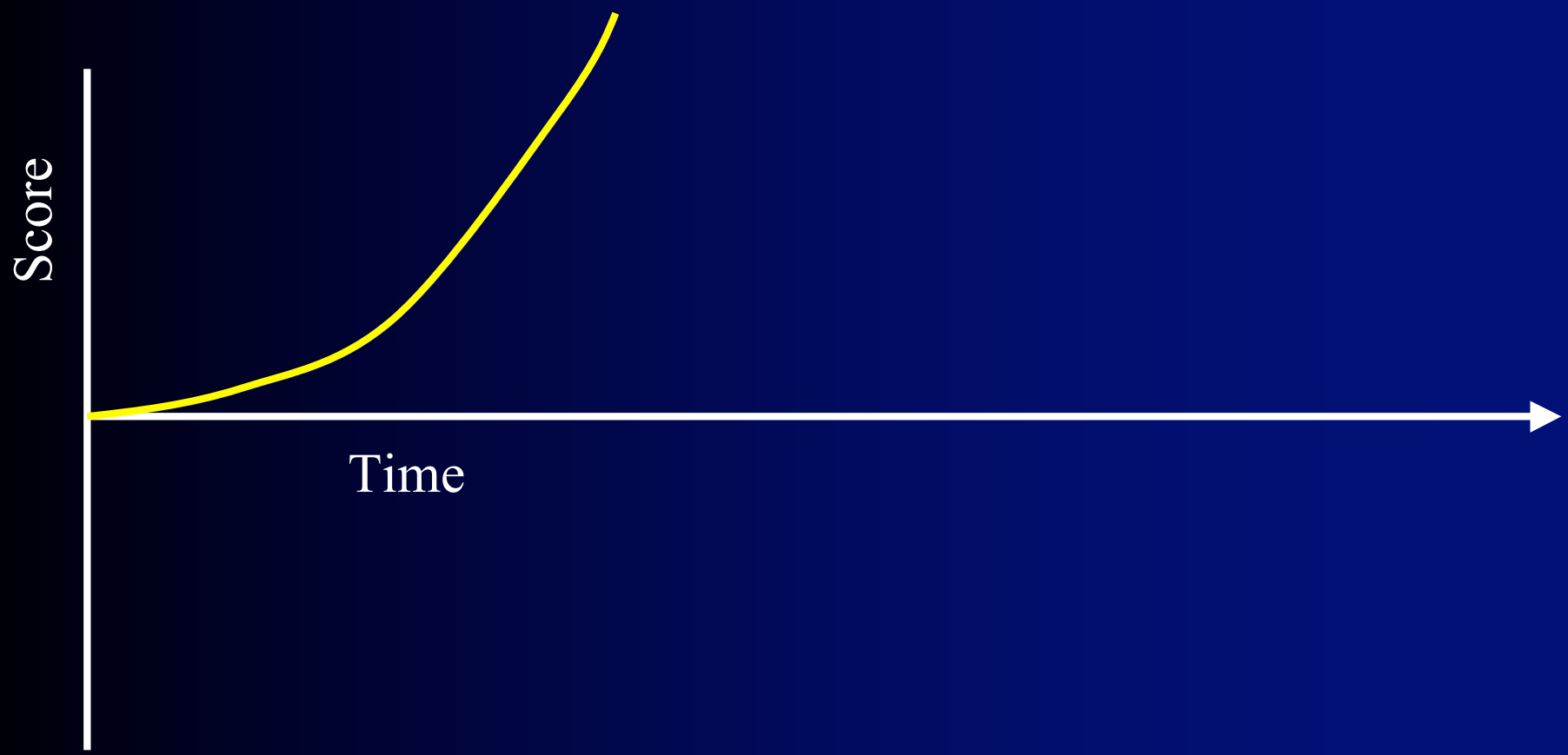
Controlling Positive Feedback

- Introduce Negative Feedback
  - An achievement that makes subsequent achievements harder
    - Gold is heavy and slows you down
    - The NFL draft
    - Upkeep costs
- Increase the impact of chance
  - If chance is fair, it helps as much as hurts!
- Define victory in non-numeric ways
  - Chess is not won by taking the most number of pieces
- Increase the difficulty level as feedback kicks in
  - This is what happens in role-playing games

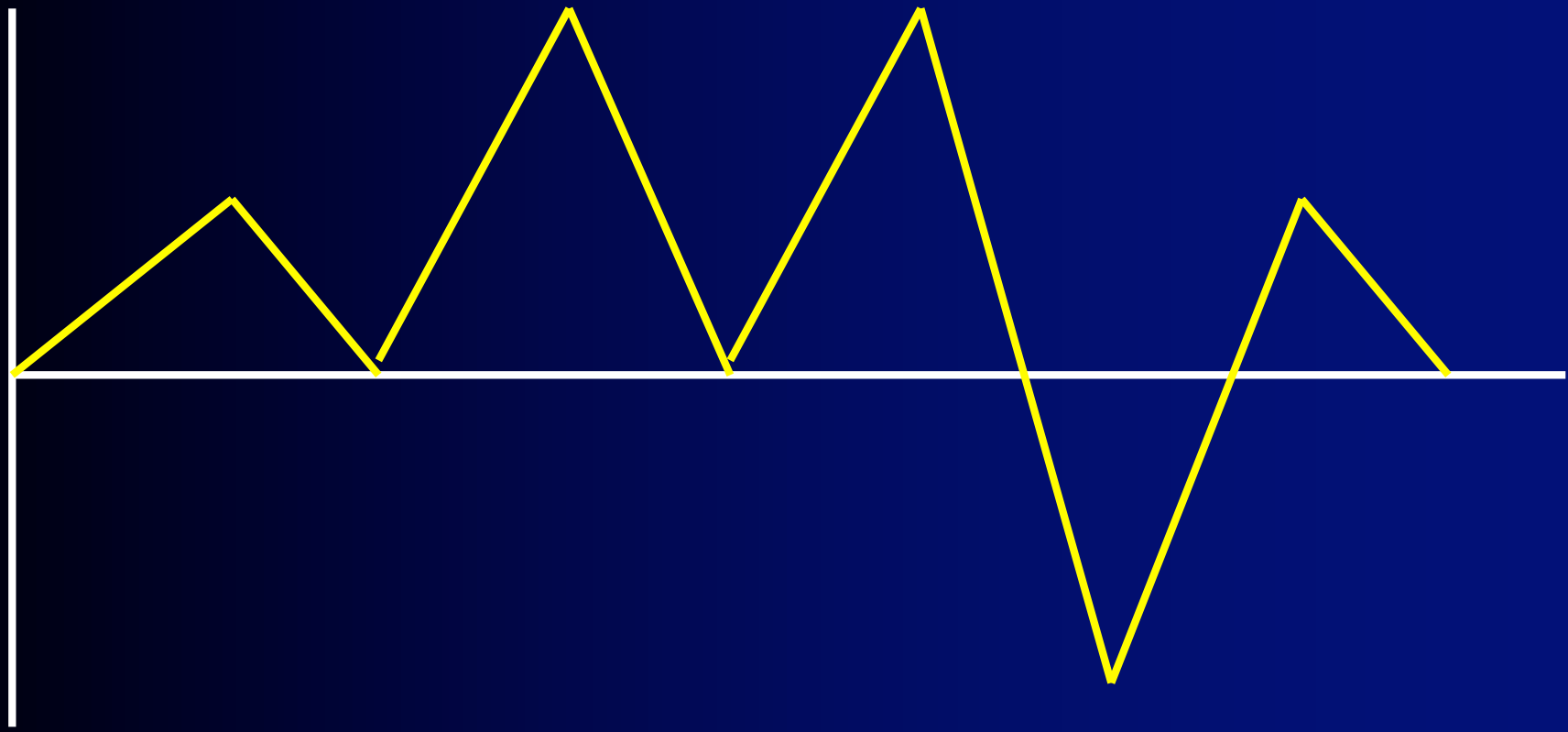
Examples of Negative Feedback

- Get ahead in a race, more likely to get lost
- Wind drag in bicycle and car racing
- In shuffleboard, if you have pieces in scoring position, easier for opponent to score
- What about single-player games?

Balance Graph: Positive Feedback

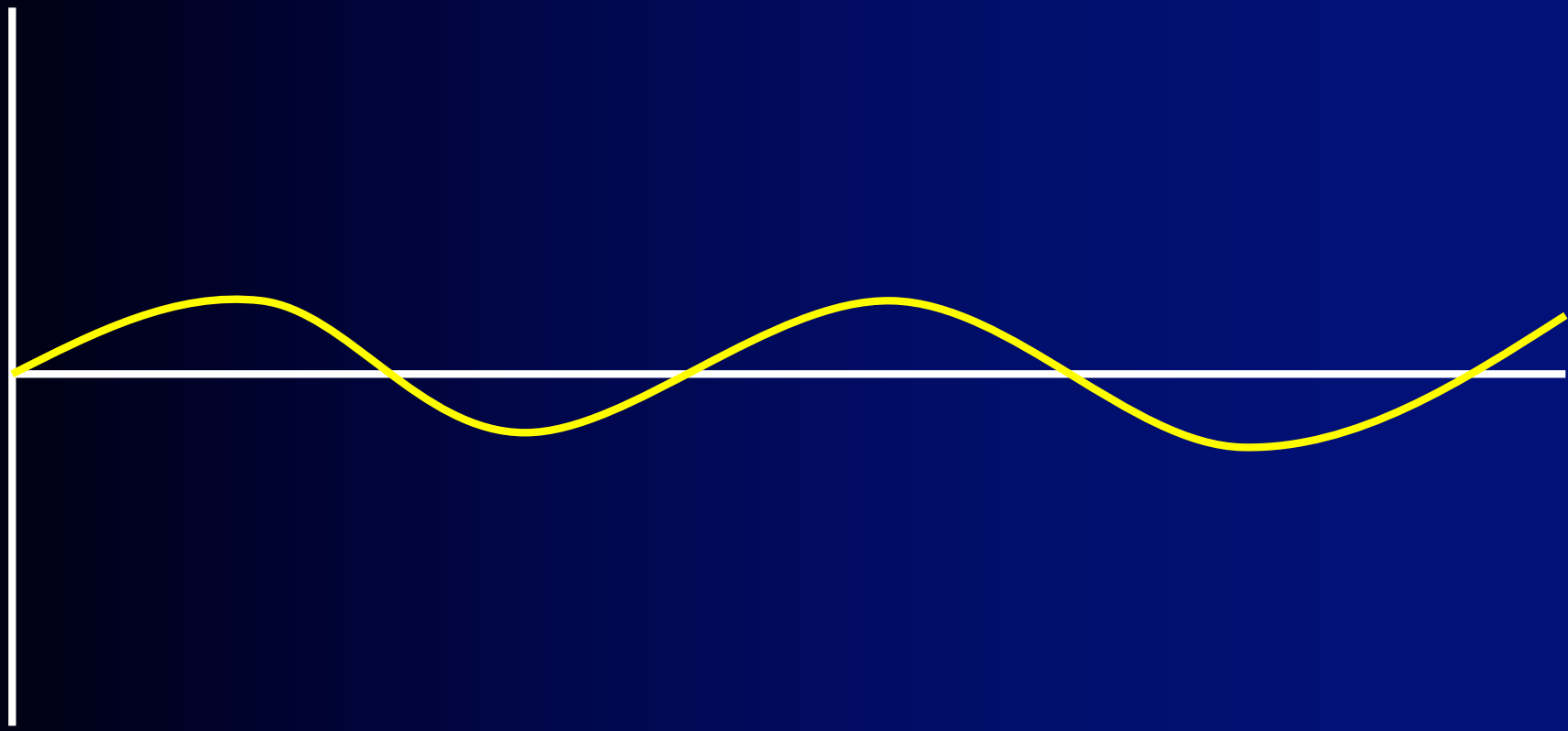


Tic Tac Toe



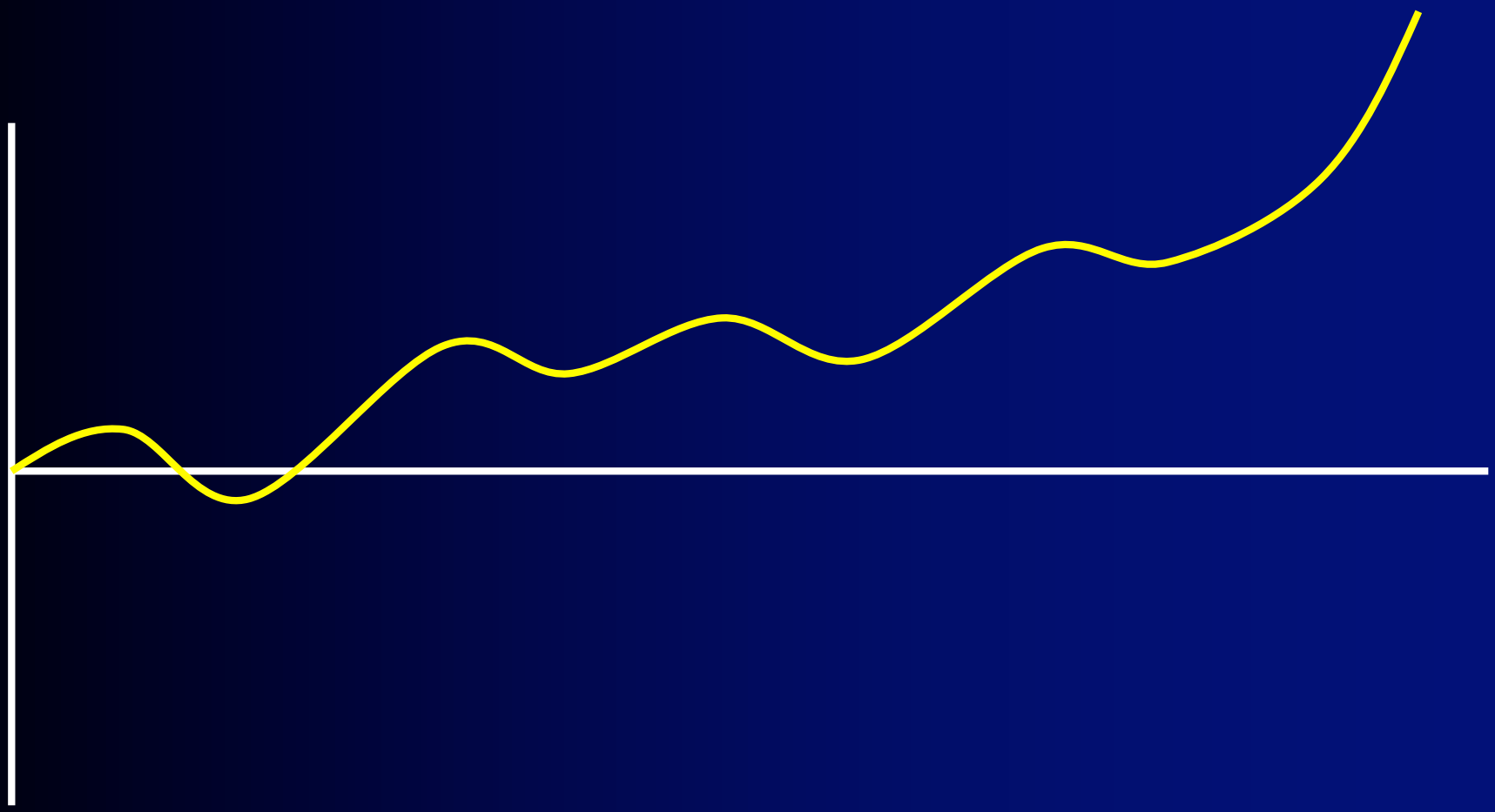
Tic Tac Toe

Stalemate



Wild Swings in Lead: Negative Feedback Too Strong

Ideal Progression



Game Settings and Worlds

- The game *world* is a mental space
  - It is the space that is not-the-real-world
  - It is governed by rules
  - It is entered by choosing to play
- The game *setting* is its fictional component
  - The setting helps the entertainment
  - Contributes to immersion and fantasy
  - The more absorbing the gameplay, the less it is needed
    - Chess and Quake players ignore it

Communicating Your Ideas: *High Concepts*

- Should be able to describe in 1-2 sentences:
  - the *high concept* of the game
  - it better be *cool* and *interesting!*
- A busty female archaeologist pursues ancient treasure
- Ping-Pong on the computer
- An ordinary technician battles trans-dimensional monsters after an accident at a secret research facility
- Armies based on ancient civilizations battle each other

Be Thorough In Your Design

- An idea:
  - “Basilisks should protect their eggs”
- A design decision
  - “When an enemy gets within 50 meters of a female basilisk’s nest that contains eggs, the basilisk will abandon all other activities (including combat) to return to the nest. She will defend the eggs even to her death. She will not leave the nest until 30 seconds after the last enemy has left the 50 meter radius.”