Emergence, cybernetic systems
- positive/negative feedback
- dynamic difficulty adjustment
- emergence exercises

Positive and Negative feedback in Cybernetic Systems
- a tool to regulate fun and interest in games
- it can happen outside the game rules, just between personalities
- think Monopoly – positive feedback
  - but the losing players can collude…

DDA
- Mario Kart
  - how does the player know about it? does it feel cheapened?
  - the balance of challenge vs. skill
  - anxiety -> flow channel -> boredom
  - but maybe the “flow channel” should \(\sqrt{\text{a bit}}\)
  - variable positive reinforcement
  - does it happen in non-digital games? (not statistically!)
    - Risk

Two kinds of games
- Emergence
  - strategy guides
  - “more than the sum of its parts”
- Progression
  - walkthroughs
  - “no more than the sum of its parts”
  - most games these days combine both
  - originally most adventure games were about progression
  - now action games (like shooters) are about emergence
  - John Conway’s Game of Life – not a game, but emergence
    - simple rules, but independent structures
  - sometimes emergence breaks the game – they can surprise you!
  - if you plan for it, is it emergence?
- orthogonal unit differentiation – Harvey Smith
  - all units should have more than one axis
  - even in a seemingly simple game system like Katamari, objects have size and shape
- parameters vs. rules
  - is there a clear distinction between them?
- rule changing games
  - players like changing strategies but not difficulty spikes
  - in multiplayer, is an all-over difficulty spike meaningless?