UPLIFT

Enabling Latent Human Capability through Games

Nathanael Ng

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Committee:
Diane Gromala (Chair), Michael Mateas, Christopher Shaw

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OVERVIEW

- Uplift: an artifact with two purposes
  - Game
  - Instrument
- Suitable for those purposes because of:
  - Compelling nature
  - Design features
  - Malleability

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HISTORY

- “Flow” as a concept
  - Martial arts
  - Sports studies
  - Psychology (Csikszentmihalyi)
  - Digital games

CSIKSZENTMIHALYI'S CHARACTERISTICS OF FLOW

- Challenging but tractable task
- Opportunity for perfect concentration
- Clear goals
- Immediate feedback
- Full task-immersion
- Sensation of exercising control
- Loss of self-consciousness (as an effect of concentration and immersion)
- Transformation of time

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ISSUES WITH FLOW RESEARCH (THE PROBLEM)

- Not easily identified
- Apparently subjective – primary instrument for measuring it IS the subject
- Needs objective metric in order to be admissible
- Hence the requirement for an instrument such as Uplift

CASE STUDIES

- Several case studies of prior work were done and the following was observed.
- Risk/reward systems tend to modulate the difficulty of a game. It is questionable whether the reward should offer the player some advantage.
- Significant difficulty scaling over a single game session can be inimical to the continuation of a flow state.
- Many, but not all, of the games observed demand extensive use of peripheral vision.

CASE STUDIES

- “Boss” encounters, whilst they increase dramatic tension, are often difficult to justify in terms of their impact on the player's mode of play.
- The requirement for memorization could potentially expand the task domain to positive effect.
- The “transformation of time” does not necessarily entail a long period of time in the flow state.
- It is possible to generate “flow-like” experiences independent of a game's interactive aspects.

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FACTORS AND INFLUENCES

- The possibility of multiple levels of intention-action coupling
- Adrenaline-induced responses
- The impact of peripheral vision
- The problem of representation
- Transformation of time; duration in “retro” vs. modern games
- Non-realtime games; cognitive tasks

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DESIGN

- FORMAT: 2D shooting game (“shmup”)
  - Affords a wide variety of representations and visual styles
  - Simplicity results in shorter development cycle
  - Established genre conventions
- INPUT DEVICE: Keyboard, as well as biofeedback option
  - High usability and familiarity; commonplace
  - Mouse input is not necessarily desirable

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DESIGN

- STAGES AND GAME PROGRESSION
  - Standard level structure
  - Increasing power level
  - Power fluctuations create challenge
  - Extra lives allow extended play

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DESIGN

- RISK/REWARD SYSTEM
  - Score multipliers for maintaining high power level
  - Score multipliers for close-in attacks
  - Pacifist mode

DESIGN

- OBSTACLES AND ADVERSARIES
  - Three enemy types, representative of common categories of adversaries
  - Boss encounters
  - Enemy encounter frequency increases with level
  - Point-based random template system
    - Template values are configurable

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DESIGN

- BIOFEEDBACK
  - Biofeedback implementation in this version is not 100% complete
  - Speed and angle are variable parameters
  - Future development could see the introduction of more parameters...
  - ...and of neurofeedback systems.

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DESIGN

- REPRESENTATIONAL PRACTICE, GAME SCHEMES, MUTABILITY
  - “Game schemes” used to package settings
  - As earlier noted, representation is difficult
  - Hence default schemes are mostly somewhat abstract
  - Game supports replacement of most game objects with wireframe or full-3D objects
  - Schemes can be created/edited in a text editor
  - Possibility of a “scheme editor” utility

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EVALUATION

- Small available sample size (interested individuals)
- Biofeedback readings did not always correlate with flow reports
- Intentional manipulation of player's biostate to gain game advantage
- Players experienced with other games made less use of biofeedback
- Volatile testing group

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ISSUES

- Constraints of Java3D and developer's limited experience
- Gameplay could use more variety
- Difficulty needs slight balancing – consequence of randomness
- Question of one-sided task domain
- General evaluation: successful as a prototype

FUTURE WORK / POTENTIAL ENHANCEMENTS

- Neurofeedback
- Session recording, including recording of parameters
- Scripted sequences
- Sound or reverse synaesthesia
- Gameplay enhancements

CONCLUSION

- Increasing interest in this aspect of interactive media
- The pleasure of being challenged
- Growing awareness that big budgets and flashy visuals are often minimally relevant to interactivity
- 'Plateau' in visual capability may introduce a renewed focus on gameplay
- Re-democratization of game design: Flash and independent games

SPECIAL THANKS

- Code used: particle systems by A. Davison, 3D model loader by Trond Abusdal
- Independent developers and players everywhere
- Testers and interested persons in IDT and Tech
- IDT faculty, and in particular the committee