UPLIFT
Enabling Latent Human Capability through Games

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OVERVIEW

Uplift: an artifact with two purposes

- Game
- Instrument

Suitable for those purposes because of:

- Compelling nature
- Design features
- Malleability
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
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
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.
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
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
DESIGN

STAGES AND GAME PROGRESSION

- Standard level structure
- Increasing power level
- Power fluctuations create challenge
- Extra lives allow extended play
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
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.
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
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
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