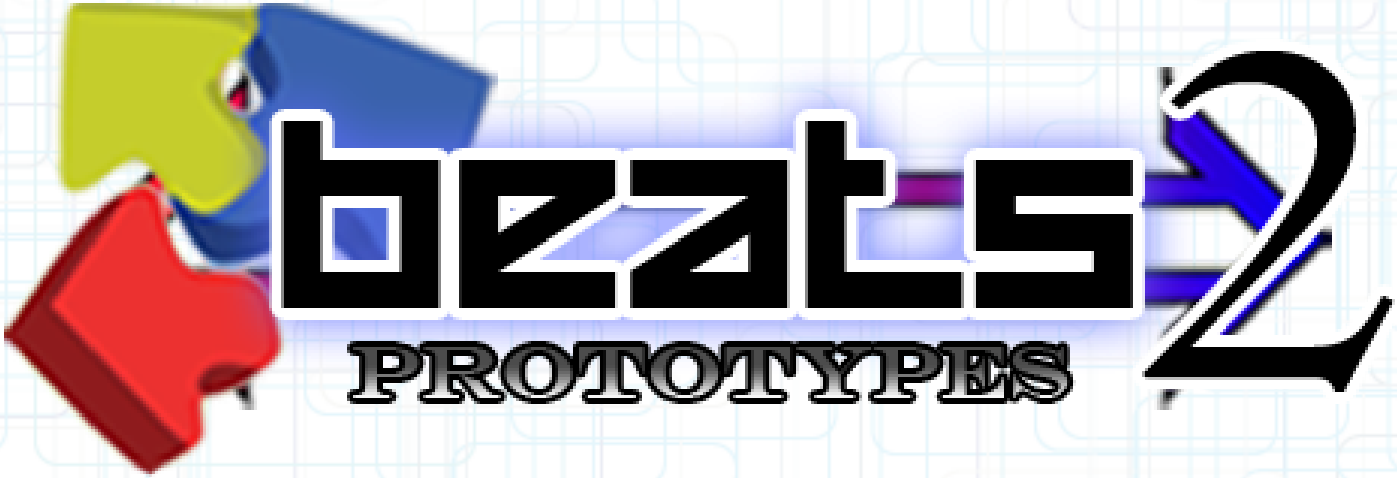
Designing Rhythm Games for Touchscreen Devices



Project Progress Report

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CIS 401, Fall 2011, University of Pennsylvania

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Presentation Overview

1) Summary
2) Project Proposal
3) Related Work
4) Project Outline
5) Progress
6) Demo
7) Results

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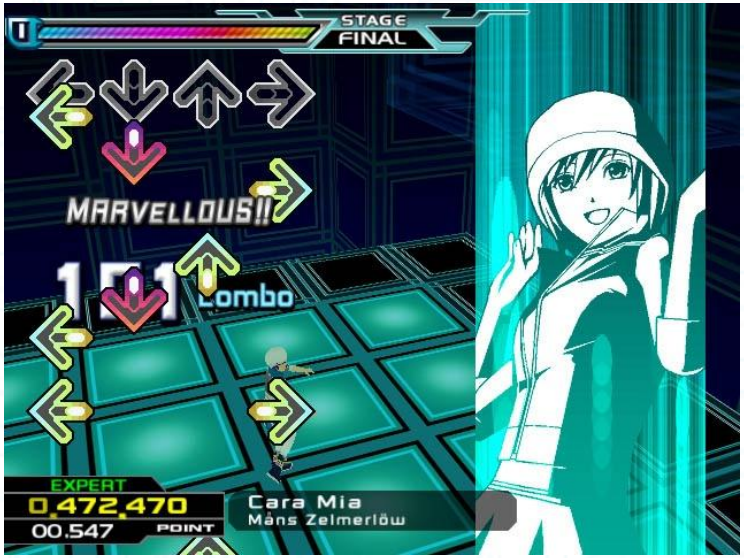
Summary

- Rhythm game: time critical, response-based
- Touchscreen: new input method
- Rhythm game for touchscreen: how to design the interface for highly reactive gameplay?



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Project Proposal

Goal:

Design, prototype, and evaluate different rhythm games interfaces for touchscreen devices.

Approach:

Create a rhythm game prototype for Android tablets that demos various game interfaces and collects usage data to evaluate their effectiveness.

Related Work

Wiimote + Dance Game

"Understanding Visual Interfaces for the Next Generation of Dance-Based Rhythm Video Games" – University of Central Florida, Orlando, FL

External Multi-touch Panel + Turn-Based Strategy Game

"A Study on Multi-Touch Interface for Game" – Chung-Ang University, Seoul, Korea

Overlayed Multi-touch Screen + Real-Time Strategy Game

"One-handed Interface for Multi-Touch Enabled Real-Time Strategy Games" – University of California, Santa Cruz, CA

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Project Outline

1) Design – Draft

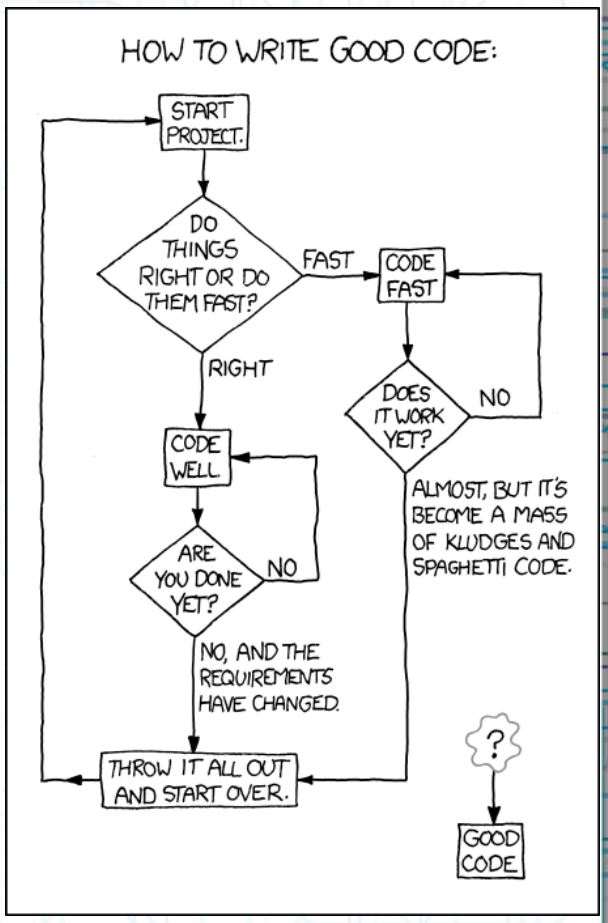
- Investigate existing interface designs
- Draft designs and evaluation metrics

2) Prototype – Code

- Implement these designs via Android
- Use common backbone to reduce non-relevant factors

3) Evaluation - Data

- Release to public with data analytics plugin
- Analyze collected data



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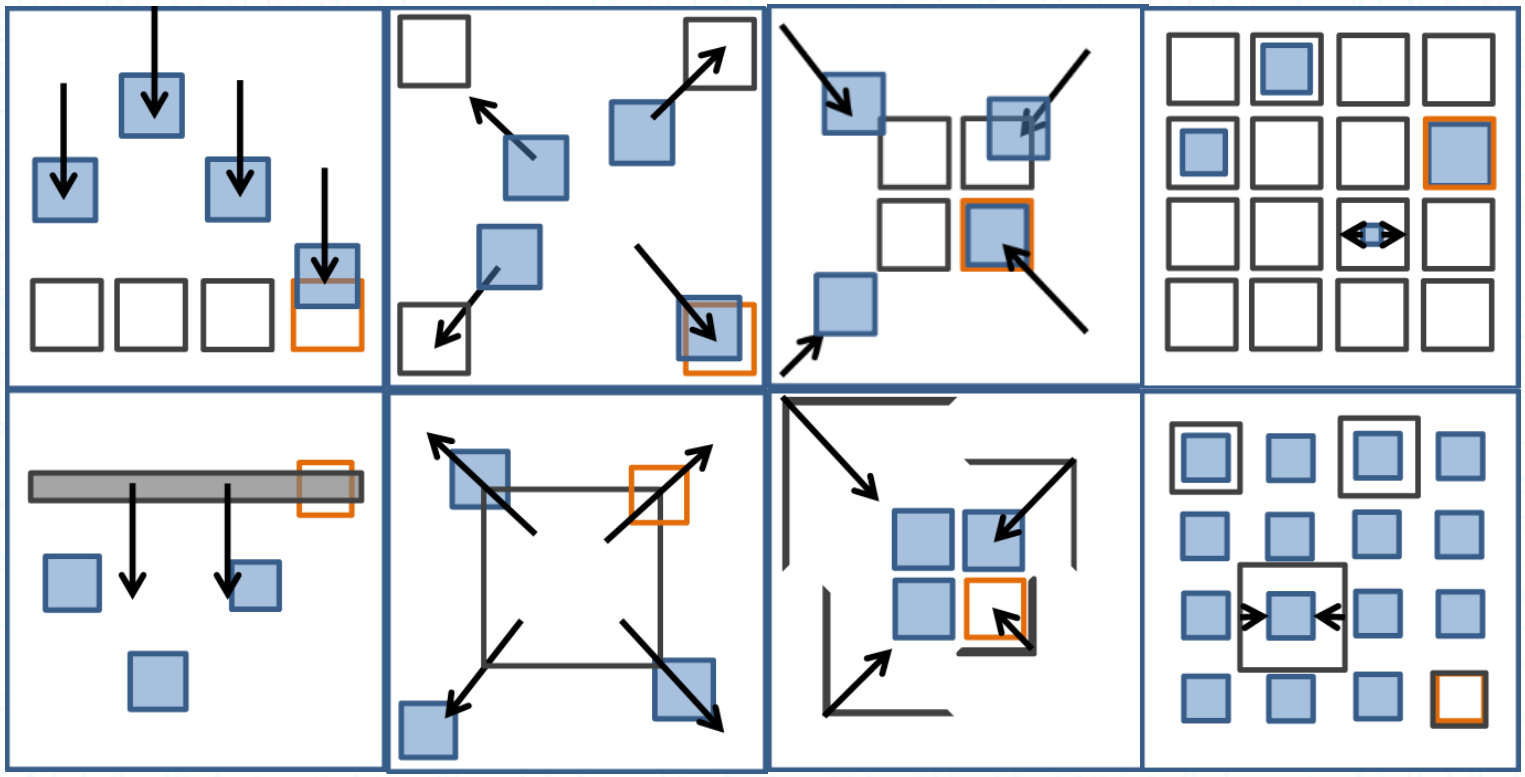
Progress

Design – Designs

- Interface designs finalized:



Progress

Design – Metrics

- Test song: smooooch (Beatmania IIDX)
  - High note frequency and 177 BPM
  - Strong audible baseline (good for rhythm)
  - Auto-generated stepfile (Dancing Monkeys)
- Metrics per design:
  - Total accuracy percent (data)
  - Missed note count (data)
  - Ranked enjoyability relative to other designs (feedback)
- Full timing chart will also be collected for overall trend analysis (if there are any)

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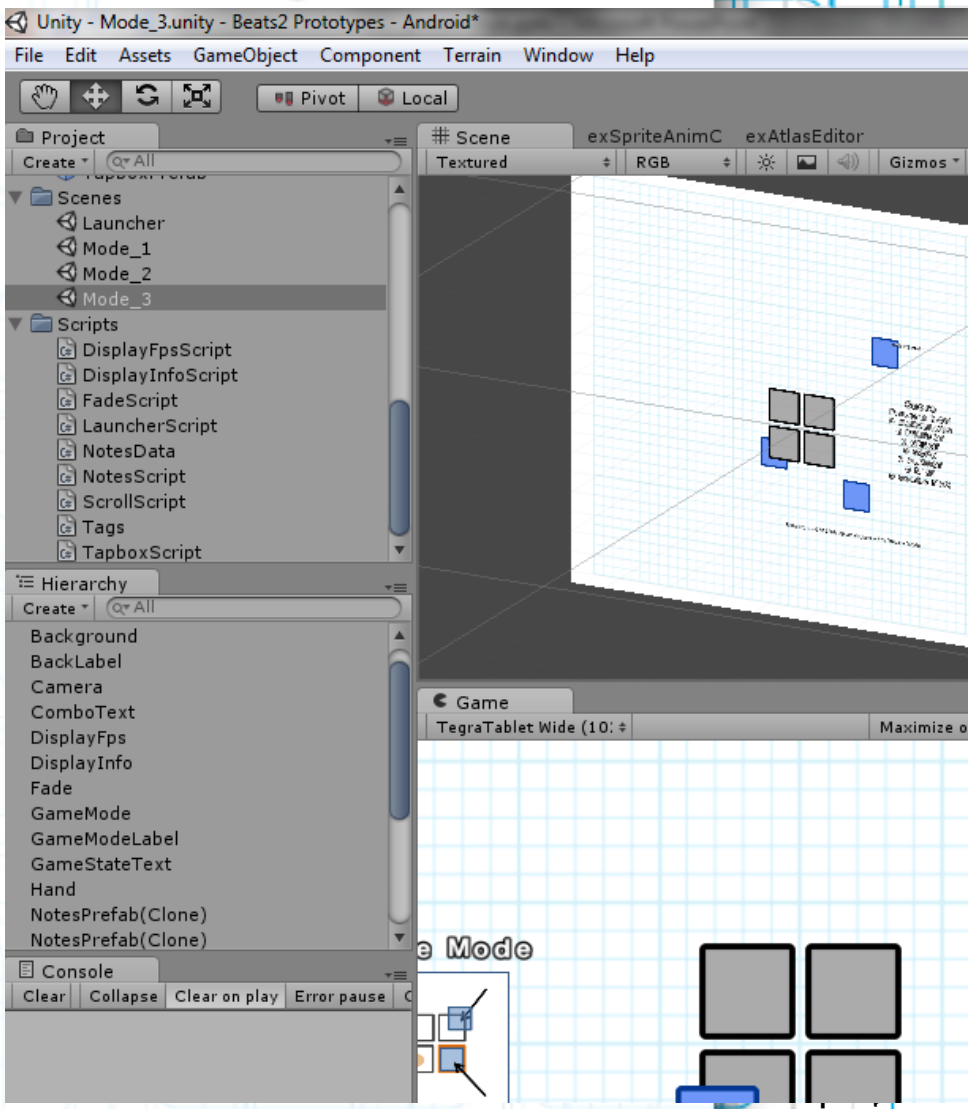
Progress

Prototype – Unity

- Biggest challenge of project
  - Game designer vs. Programmer
  - Unity = GameObject driven workflow
  - New to C#

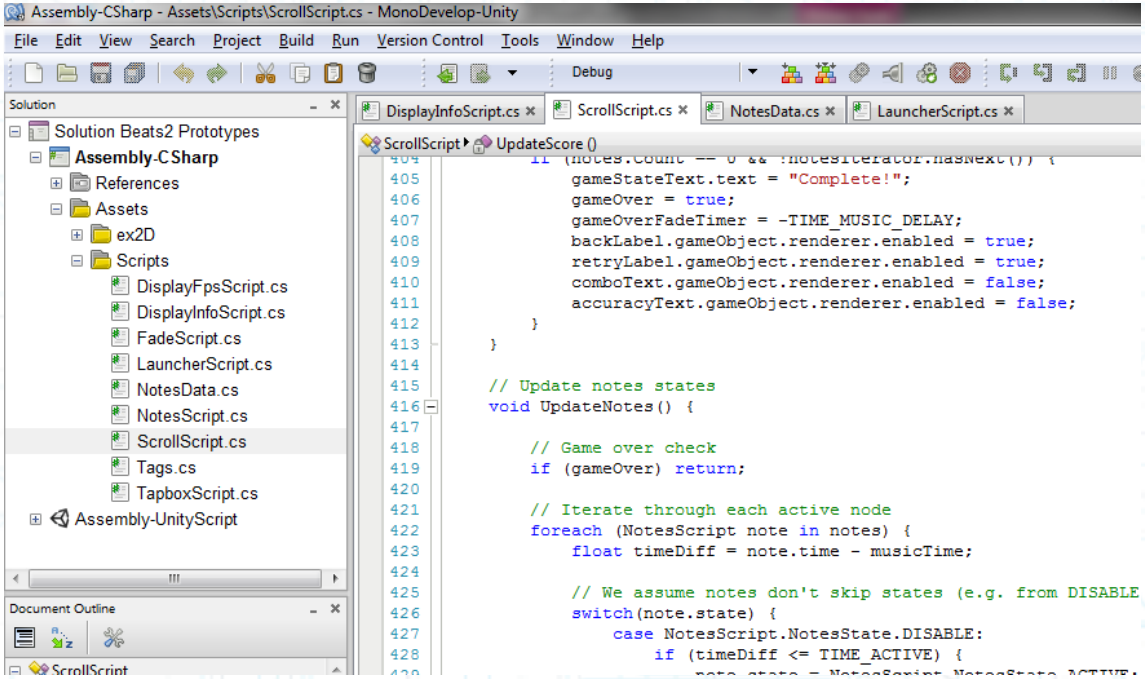
- Game Engine Experimentation
  - Android + iOS license
  - Othello2D vs ex2D
  - TouchGestures overcomplicated
  - MonoDevelop minimalistic



Progress

Prototype – Coding

- Flexible game engine
  - Timer, audio-synchronized
  - Dynamic object generator, memory efficient
  - Score tracking, based on timing accuracy
  - Runs on Android tablet and Windows
  - Adding new modes (interfaces) easy

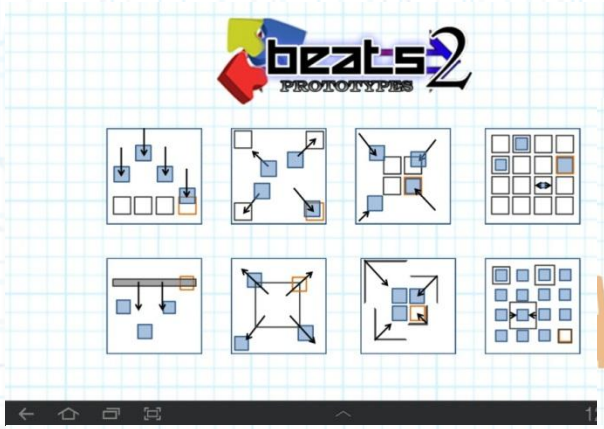


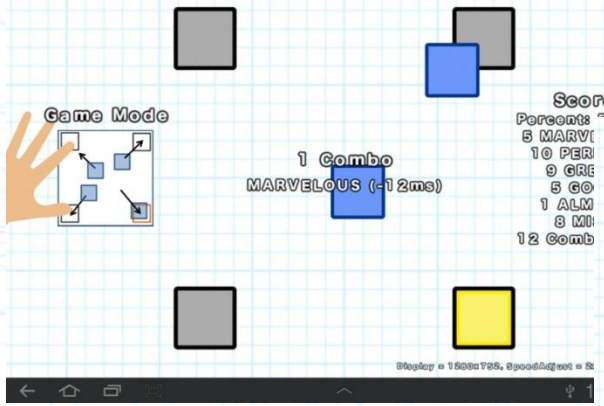
Progress

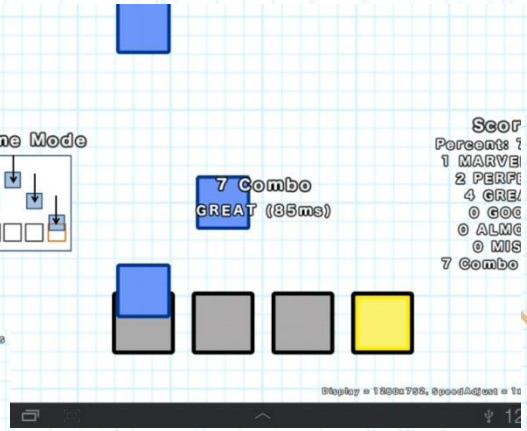
Evaluation – Setup

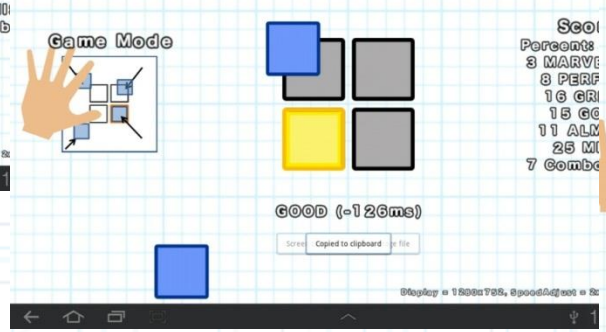
- Tweaking stage
  - Change object placements based on feedback
  - Tweak timing parameters
  - Improve graphics?
- Google Analytics vs own server
  - Analytics: generate graphs but limited info collection
  - Server: custom information but have to set up
- Mass release on Android Market
  - Use Beats' update notifier to advertise (100k+ active users)

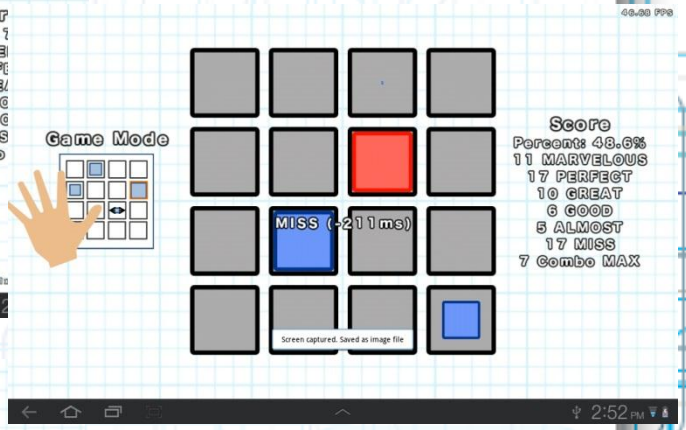
Demo

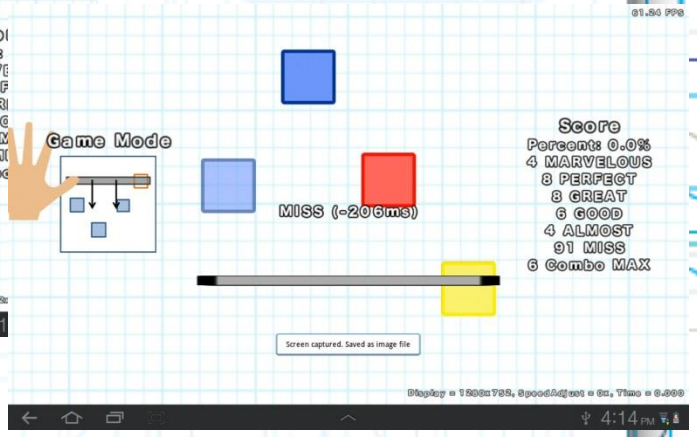












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Results

Programming:

- Unity hard to learn but very flexible and worthwhile - write once, deploy everywhere
- ex2D very useful but very buggy and crashes
- Framerate very good (consistent 60fps) but timing window a bit too big (~15ns update rate)
- Code currently in one main script – need to learn more about Unity coding conventions (static global object?)

Results

Informal surveys:

- Testers used to DDR style scrolling
- Speed needs to be tweaked (some tester just had slow visual processing times)
- Tapbox placement definitely a factor (proximity to each other, spread of focus)
- Enjoyment factor independent from performance
- May try two songs to eliminate song familiarity from evaluation

Questions?


MercurialMadnessMan 767 points 13 days ago [-]
Sorry, this isn't really a question