

# Trace Race on Facebook

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## ABSTRACT

*Games as Facebook applications have proliferated once the platform opened freely to developers. Paper-and-pencil games are inherently social in nature and typically simplistic yet challenging, and are thus well-suited to implementation on such the Facebook platform. With inspiration drawn from existing Facebook game applications, the aim of this project is to convert the paper-and-pencil game known as "Trace Race" into an online social game deployed on Facebook. Current web technologies, including Flash and ActionScript, MySQL and PHP, and Facebook Markup Language (FBML) and Facebook JavaScript (FBJS) will be used to develop the game features. A clean and usable design is desired to promote the enjoyment of the game as the overarching goal.*

*Project Blog: <http://tracerace.blogspot.com/>*

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## 1. INTRODUCTION

Since Facebook opened up to outside developers, a massive number of applications have been built for all sorts of purposes, one of the most prominent being to increase the social capabilities of Facebook. While games--online and off--are developed with the primary purpose of entertainment, the social experience is a close second. Offline games inherently bring friends together to share in fun and a bit of competition. Therefore, it makes sense to leverage Facebook as a social gaming platform. As evidence, simply consider the success of Zynga, a social gaming company: see Facebook's [list of popular game applications](#) and [Zynga news](#).

Paper-and-pencil games are particularly suitable for Facebook deployment. They are often playable by a variable number of participants and by nature do not require much in the way of materials. Therefore, such a game should translate fairly easily into an online format, and once as such, should be simple to learn and an attractive social activity.

With this in mind, the goal of this project is to convert a lesser-known paper-and-pencil game, known colloquially as "[Racetrack](#)" and by similar names, into a real-time multiplayer game application. The main gameplay will utilize Flash/ActionScript and will be embedded into a surrounding user interface as a Facebook application with clean, attractive design and high consideration for usability. I will take advantage of the Facebook developer platform to build additional features not easily implemented with paper and pencil, and to integrate with Facebook's social capabilities.

### 1.1 Design Goals

Since the bare rules of the game are pretty simple yet the strategy can take some time and experience to develop, the game should be suitable for probably the whole age range of Facebook users. Interactivity with the game should be

at once easy and interesting such that it promotes engagement of this entire user base.

While a clean design and interesting additional features are goals of the intrinsic application design, the primary user-centric aim is to create a challenging, intriguing, enjoyable, and social gameplay experience.

### 1.2 Projects Features and Functionality

A preliminary list of proposed game/application features:

- choice of grid size (dimensions)
- pre-made tracks (for the lazy users)
- option to design your own track, and save it
- real-time updating of all players' turns (no page refresh, etc. required)
- show user the possible moves for the turn, to prevent illegal moves
- a computer (AI) opponent, against which a single or multiple players can play, at several levels of (non-perfect) intelligence/difficulty
- in multiplayer mode, invite friends to play and/or play against other random users currently logged in
- archive of images of past completed games
- introductory, about, help pages
- possibly store and make retrievable some statistics

## 2. RELATED WORK

Here are several Facebook applications that have similar features or design characteristics to which I am comparing my ideas:

- **PaperRace** – This is an existing Facebook application that implements the same paper-and-pencil game I am going to implement, but it has several differences and key drawbacks. Feature-wise, it is a one-player-only game, and it does not allow you to design your own tracks. It is also implemented using an SVG image as opposed to Flash. Therefore, what I aim to accomplish is more sophisticated and different technically. [PR]
- **Guess the Sketch Challenge** – This is an example of a multiplayer, real-time game implemented in Flash on Facebook. One player is given a word to draw and all other users simultaneously see what is being drawn and attempt to guess the word, i.e., this is Pictionary on Facebook. In terms of my project, this game is proof that a fairly simple (NOT a complex, MMORPG-scale) multiplayer live game is possible. [GSC]
- **Scramble** – This is another multiplayer Facebook game that involves real-time/live updating without page refreshing. In this case, which is closer to what I will be doing, only simple information needs to be updated: as players gather points, they are rearranged on each player's screen according to current highest score. Without knowing how it works, I would guess that it is accomplished by some kind of polling mechanism and the score ranking is simply refreshed every couple seconds or so. On another note, one feature that really ups the competition in this game is having a limited time and a countdown—thus players are encouraged to move quickly and do not become bored waiting for something to happen. [S]
- **Checkers** – The Facebook game simply called Checkers is interesting in several relevant ways:
  - It does not appear to use Flash for the gameplay area—instead it uses images placed precisely on the page. (Thus, it makes sense that you do not drag your checkers piece to make a move, but click to select a piece and then click again to select its destination.)
  - It is a strictly turn-based game (each player must move in turn, rather than taking an action at any given time, as in the other games referenced above), but to prevent endless waiting for an opponent to take their turn, a one-minute time limit is imposed and displayed with a countdown in seconds.
  - A game can be started simply with another player who is displayed as currently logged in to the app.
  - The game progresses with real-time updates, as I want mine to do: both players see each other's moves. A simple “chat” between players is also available in the form of posting short messages on the gameplay page.
  - Since the game isn't Flash-based, there cannot be a Flash game server behind it to track the two players' actions; I may be able to

look into the app's code further to see if perhaps it is using polling to check whether a player has moved. The turnover between player moves is quick, though, so whatever method this app uses would be more than sufficient for mine. [C]

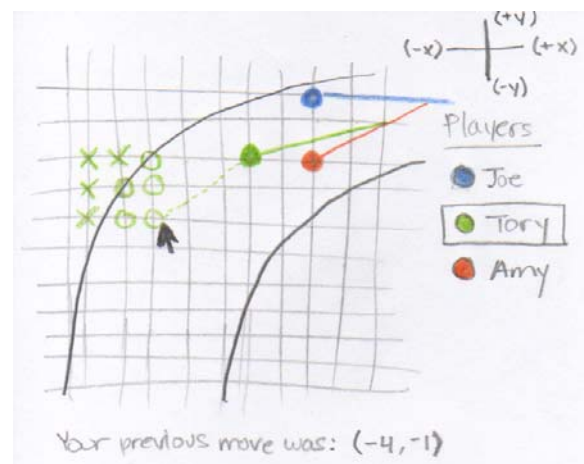
- **Grabber** – This is another word-based game on Facebook. Like Checkers, it is strictly turn-based and you can start a game with players currently listed as logged on. Unlike Checkers, it supports more than just two players (as my game will) and the main game area including the chat box is built in Flash. The actual game is a bit more complex than mine, but feature-wise, this app lines up with most of my core implementation plan. With a bit more thought it is also inspiring me to consider including some sort of chat functionality (even if it is primitive), as this can definitely increase the social enjoyment of the game. [G]

### 3. PROJECT PROPOSAL

There are tons of Facebook games out there; my game is not intended to be unique or fascinating enough to revolutionize the social gaming world. Instead, my humble goal is to produce a quality application that uses current web technologies effectively to create an enjoyable and satisfying user experience. In doing so I will gain a broad range of web development experience which I find both interesting and likely useful for my future.

#### 3.1 Anticipated Approach

Following is a primarily schematic diagram showing the basic procedure of gameplay as it will be implemented. (This should not, for the most part, be taken as representative of intended interface/application visual design.)



**Figure 1.** Partial gameplay schematic.

This diagram represents only what would be a piece of a full racetrack on a grid. Players are designated on the grid with different colored dots, and their progress at each move is tracked in a connect-the-dots fashion. On a player's turn, his/her possible moves are denoted with open circles if within the track boundaries or with x's if outside. (For a given game, players can decide whether the points falling

directly on the border count as in or out.) Moves are described using vector notation, e.g. (-4, -1) means moving four steps in the negative-x direction and one step in the negative-y direction. (See the axes defined in the upper right of the diagram.) As shown, when a player mouses over a potential move point, the dotted line shows what their progress would be if that move is chosen.

### 3.2 Target Platforms

Facebook is the platform for which the game will be developed. Therefore, the front-end surrounding implementation will use Facebook Markup Language (FBML—the Facebook equivalent of HTML) and Facebook JavaScript (FBJS). The main game will be implemented in Flash and supported by ActionScript. A MySQL database will be used to store data. The program to manage computer opponent AI will be written in some language yet to be determined and implement a shortest-path algorithm tweaked so that its intelligence is not “perfect”. PHP will be used to communicate between the front and back end, and the Facebook PHP library will be used to integrate Facebook’s social features into the application (such as displaying logged-in users and friends).

### 3.3 Evaluation Criteria

Once completed, gameplay and additional application features can be played and tested simply for their enjoyment and social benefit. Design, usability, and features can be compared to other Facebook games with similar characteristics, such as those listed in the “Related Work” section of this document.

## 4. RESEARCH TIMELINE

Finally, we would like you to speculate about the pace of your research progress. This section need not be lengthy, we would just like you to specify some milestones so we can gauge your progress during our intermediate interviews. Let us follow through with our image recognition example:

### Project Milestone Report (Alpha Version)

- Have a body of directive advice collected from discussion with project advisor regarding any major holes in understanding of proposed elements of implementation
- Research of tutorials and sample code collected
- Sketches of visual layout converted into minimally interactive (mostly mock) online page
- Facebook application set up, MySQL database set up, and test communications via PHP confirmed to work
- At the least, a minimally operational Flash object, possibly with multiplayer functionality tested

### Project Final Deliverables

- Working, integrated, bug-free Facebook game application

### Project Future Tasks

With additional time, I would implement for sure the features I am initially designating as optional:

- Archiving of completed games and ability for users to save them
- Game statistics
- Levels of difficulty of computer opponent
- More customization options for user-designed tracks

### Gantt Chart

Please see attached Gantt Chart (**Figure 2**) presenting a rough timeline of tasks. Ends of bars are deliberately “fuzzy” to allow for additional time reworking, debugging, and the like.

(The following sections to be filled in as progress is made.)

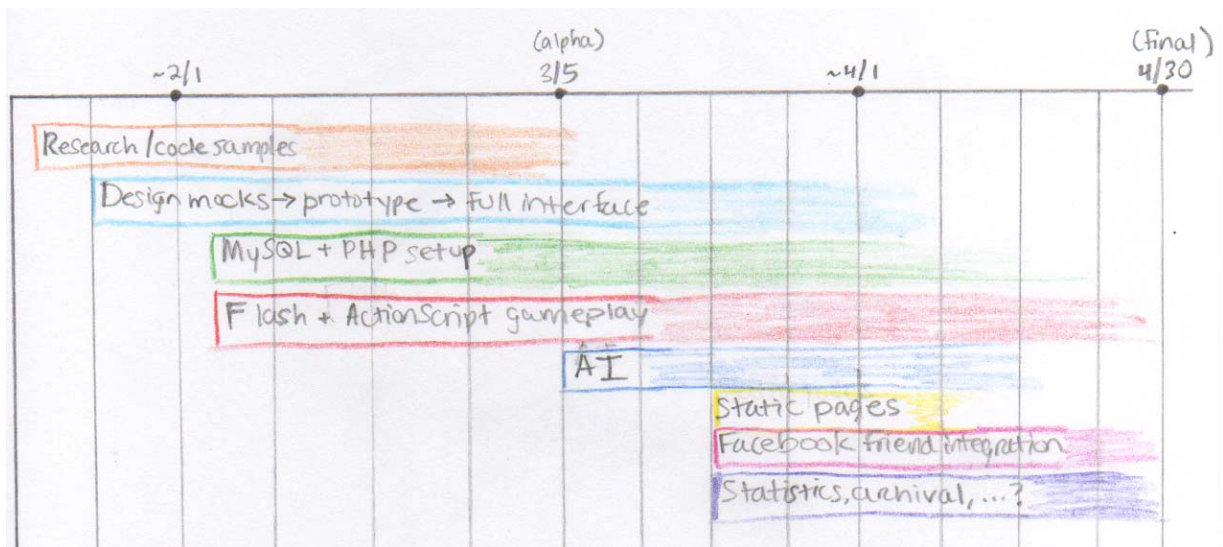
## 5. Method

## 6. RESULTS

## 7. CONCLUSIONS and FUTURE WORK

### References

- [PR] PaperRace (Facebook game application), <http://apps.facebook.com/paperrace/>
- [GSC] Guess the Sketch Challenge (Facebook game application), <http://apps.facebook.com/drawing-game/>
- [S] Scramble (Facebook game application), <http://apps.facebook.com/scramblegame/>
- [C] Checkers (Facebook game application), <http://apps.facebook.com/playcheckersgame/>
- [G] Grabbler (Facebook game application), <http://apps.facebook.com/grabbler/>



**Figure 2.** A rough proposed timeline. Vertical lines approximate weeks; key dates are labeled.