Multi-User Applications for iPhone

Using Networking in the development of engaging mobile applications

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Abstract

We set out to explore iPhone's abilities as an engaging multi-user game environment. Apple's iPhone shows great potential for diverse new mobile applications with its powerful hardware and its multiple forms of user input (accelerometer data and multi-touch gestures). We took advantage of these unique capabilities to create two multi-player games for the iPhone: *Wap It* and *Turret Wars*.
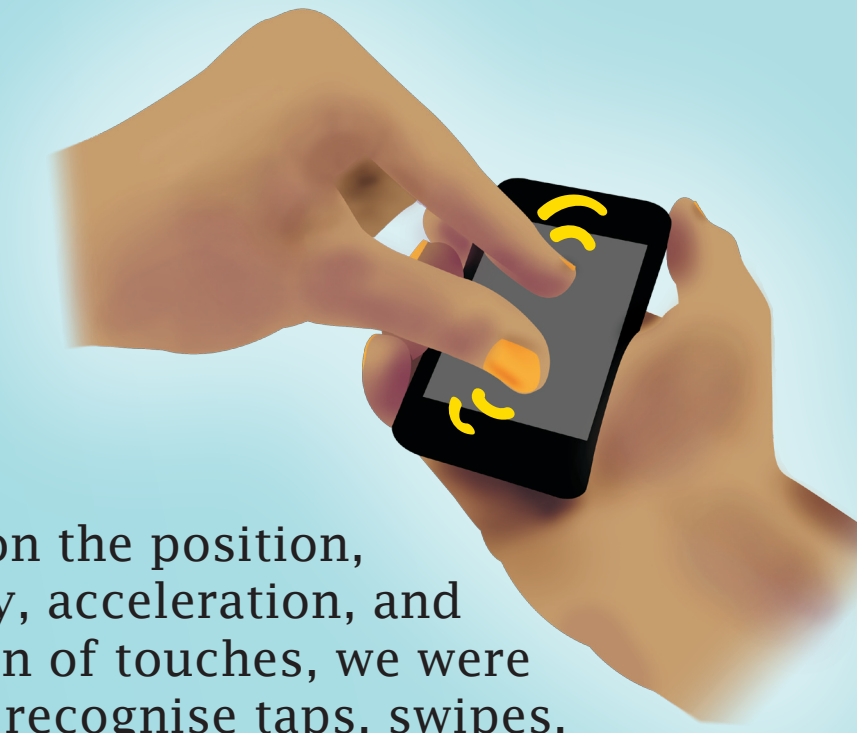
Technologies

1 Networking over local "Wi-Fi"

Using a UDP protocol, the application looks for other devices running the same application and communicates back and forth with them.
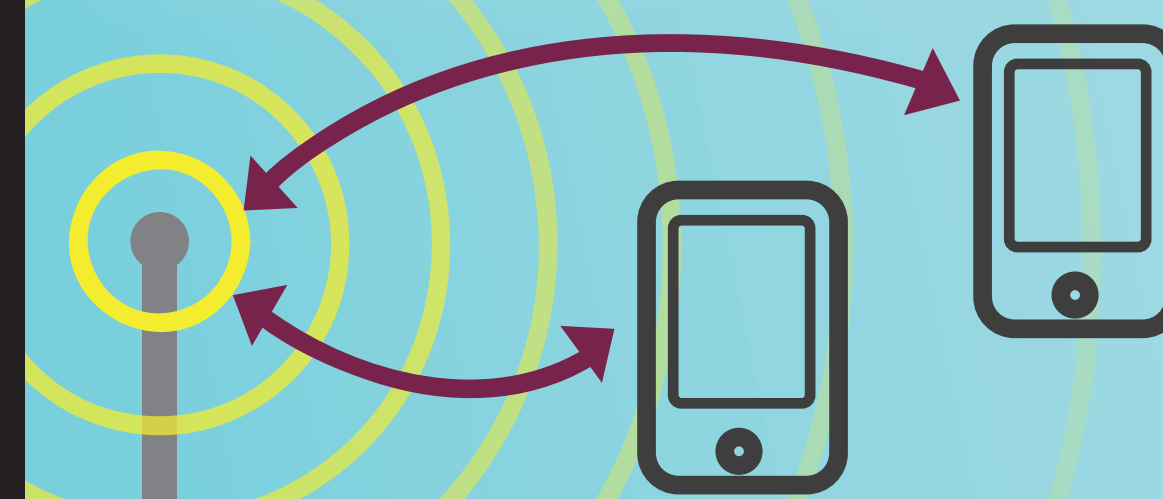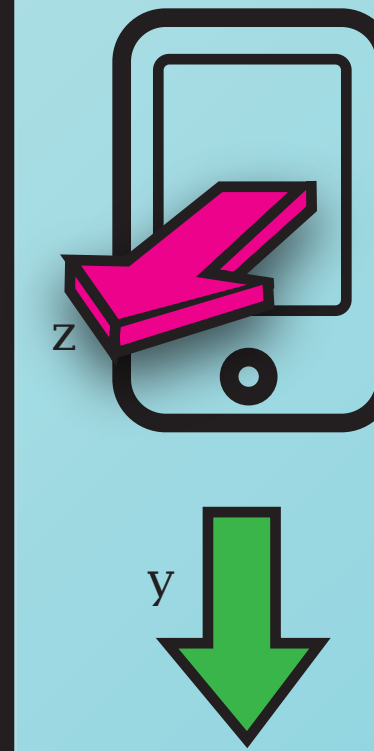
2 Touch screen gesture recognition

Based on the position, velocity, acceleration, and duration of touches, we were able to recognise taps, swipes, and pinch gestures.

3 Use of accelerometer

z   x   y

The built in accelerometer is able to detect force in three dimensions and is updated 40 times per second. Using algorithms to analyze peaks in acceleration, we are able to detect orientation and movement on an iPhone and use that data in our applications.

WAP IT!

We designed *Wap It* after the popular children's toy *Bop It*. The game follows a basic command and response structure, where players are asked to perform a gesture to the beat of the music. Over time the speed increases, making it more difficult. The multiplayer version is played on more than one iPhone. Players take turns, on each turn doing a certain amount of gestures and "passing" to the next player. The other players can see what the active player is doing and hear the beat on their iPhones, similar to how the original game was played in a group.

The gestures that *Wap it* detects are:

SWIPE IT!   A linear swipe across the screen

SHAKE IT!   A shake motion detected by the acclerometer

PINCH IT!   A pinch motion on the touch screen

WAP IT!   A single tap

Shake it! *Wap It* takes advantage of iPhone's built in accelerometer to detect if the user shakes the phone.

Turret Wars

Turret Wars is a multiplayer game based on the classic DOS game, *Dome War*s. Terrain is randomly generated and players have turrets that are randomly placed upon the terrain. The turrets can be aimed and fired using finger gestures. Players take turns firing shots that can damage the other turrets as well as the terrain. The last player standing wins.
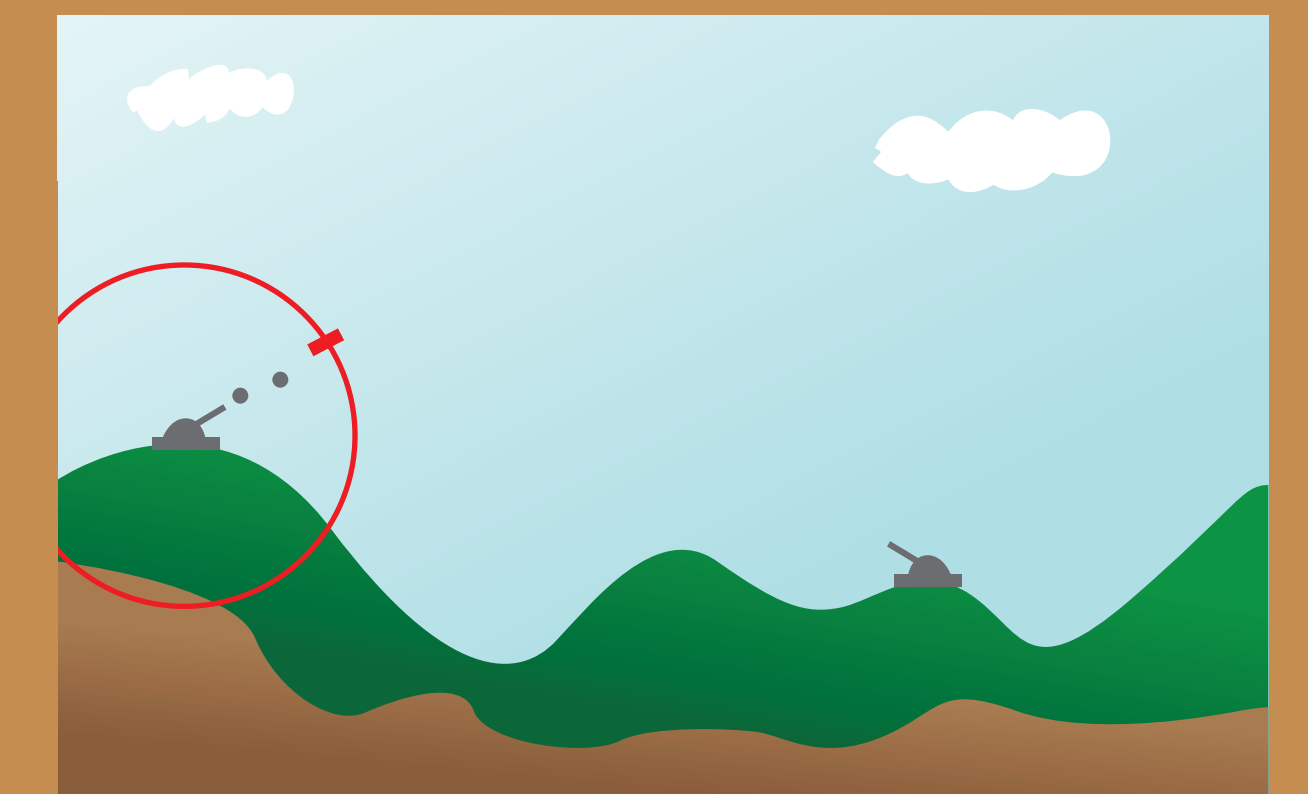
Future Work

- **Enhance educational software** – Incorporate multi-touch and accelerometer inputs into existing mobile educational software.
- **Language learning software** – Learn language on the go, using animation to convey meanings and make tasks more interesting.
- **Collaborative design software** – Enable design teams to communicate ideas and concepts graphically and interactively.

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