Final Project

Workout Tracking iOS App

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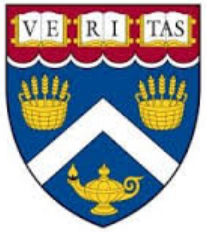


Harvard University Extension School

DGMD S-14: Wearable Devices and Computer Vision

Introduction

- Interest: Fitness & workout tracker apps

- Goal: Create iOS Workout tracker app for tracking Runs and bike rides

Team

- Christian Hilton
- Team role: CTO, Product Manager, Engineer

Technology

- Software & Dev Tools:
  Language: Swift
  IDE: Xcode

- Hardware:
  iPhone XR,
  MacBook Pro, USB-C cable

- Frameworks:
  Core Motion
  Core Location

Features

- Active Workout:
  Start, pause, complete.
  View speed, distance, timer while active.
  Choice of 2 types: run or bike.

- View Workouts Summary:
  Previous workouts including duration, distance, type.
  Feedback on previous workouts, including number.

Data

- iOS Frameworks provided several options for data objects

- CLLocation: latitude, longitude, and course information

```
<+37.76843873,-122.44815369> +/- 14.20m (speed 0.42 mps / course 148.29) @
7/31/21, 3:45:25 PM Pacific Daylight Time
```

- CMDeviceMotion: measurements of the attitude, rotation rate, and acceleration of a device

```
Optional(x -0.144440 y 0.224274 z 0.360016 @ 177439.619961)
```

- CMPedometerData: Information about the distance traveled by a user on foot.

```
CMPedometerData,<startDate 2021-08-01 00:49:02 +0000 endDate 2021-08-01 00:49:29
+0000 steps 18 distance 16.49390449002385 floorsAscended 0 floorsDescended 0
currentPace (null) currentCadence (null) averageActivePace 0.6389671109332803>
```

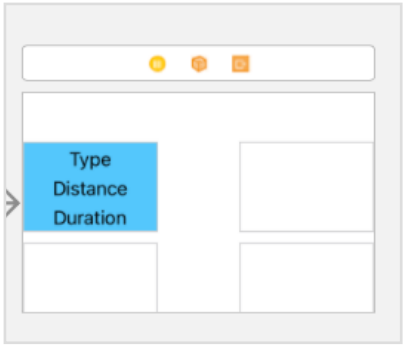
Methods

- Interface Builder / Storyboards
- Model - View - Controller pattern
- Poll live data from iPhone
- Emphasis on Pedometer data

Methods


```
extension MainViewController: UITableViewDataSource {

    func tableView(_ tableView: UITableView, numberOfRowsInSection
        section: Int) -> Int {
        return currentWorkout?.getData().count ?? 0
    }

    func tableView(_ tableView: UITableView,
                   cellForRowAt indexPath: IndexPath) -> UITableViewCell {
        // Ask for a cell of the appropriate type.
        let cell = tableView.dequeueReusableCell(withIdentifier:
            "basicStyleCell", for: indexPath)

        let data = currentWorkout?.getData()
        let curData: (String, String) = data?[indexPath.row] ?? ("", "")
        cell.textLabel!.text = "\(curData.0) \(curData.1)"
        return cell
    }
}
```

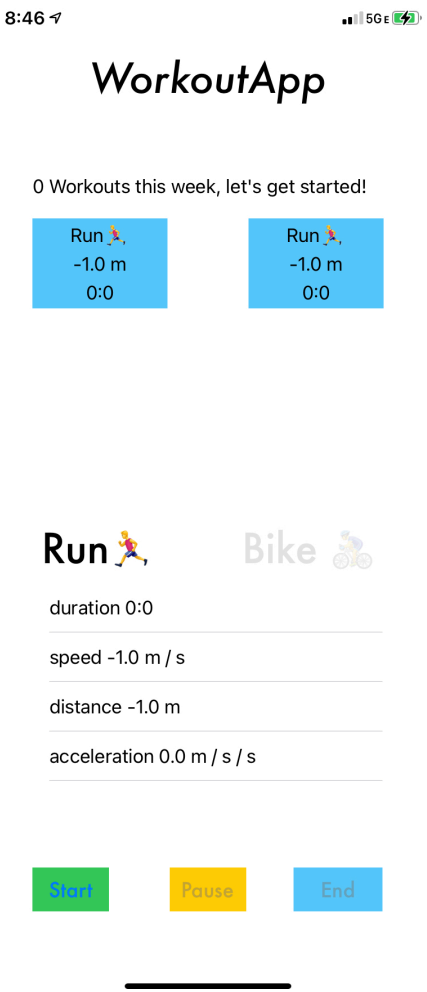
- Tableview: Display WorkoutSession data




```
class WorkoutsCollectionViewController: UICollectionViewController {

    let dataSource: [WorkoutSession] = [WorkoutSession(), WorkoutSession()]

    override func viewDidLoad() {
        super.viewDidLoad()
    }

    override func collectionView(_ collectionView: UICollectionView,
        numberOfItemsInSection section: Int) -> Int {

        print(dataSource.count)
        return dataSource.count

    }
```

- CollectionView: Display past workouts as grid

User Interface



Future Development

- Expansion to multiple workout types
- Dynamic feedback based on performance
- Machine learning / analysis on workout data
- Watch app

Conclusions

- Wearables are a very broad field, my focus would be UI
- Location data has high margin of error
- Great potential for fitness enhancing app development.
- Wearable software development is fun!

Questions?