ARKit Independent Study Summary
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Professor: Dale Haverstock
Student: Raymond J. Weiss

When beginning this course we aimed to explore the features now available to Apple developers from Apple's newly released ARKit library. This library allowed developers to leverage the hardware of iPhone 7's and newer in an augmented reality world. To do this we worked in week long iterations over a 16 week period. Each week a new Xcode project would be created from the previous week's with features added on. Each of these projects was committed to an SVN repository accessible with the right credentials via https://svn.cs.kent.edu/18S-iOS_Project/svn/.

The first few weeks were spent getting familiar with the new library's features. I used official Apple documentation and on-line tutorials to learn how to set up a basic AR scene. Once I was able to set up an AR scene I learned how to add objects to it and change/interact with those objects. Once a fundamental understanding of ARKit was established, we began to brainstorm potential uses of this technology. We thought that the technology could potentially be integrated with location services to place AR objects in the real world and maintain their positions. A use we came up with for this functionality was a parking app that would allow a user to place an object at their parked car then navigate back to it via augmented reality. This was the initial use we pursued. A 3D arrow was implemented in the AR scene that would always be a set distance in front of the user. This would point the user back to their placed object. Saving and loading of the objects was then implemented. This was done using Apple's Core Location library. The user's current location was established and the origin of the AR scene was mapped to a real world latitude and longitude. The real world latitude and longitude of the objects placed in the AR world were then calculated. With this method objects could be saved and loaded. The parking app's main functionality was done being implemented before the course was over. We continued on with additional features / uses for the technology. We went in the direction of a "waypoint" based game. This game would allow waypoints to be placed and saved. If the save file was distributed to a phone the waypoints could be loaded to any device. A user would then start a timer implemented in the app and collect as many waypoints as possible in a set amount of time. The waypoints would have to be collected in order. Waypoint objects would change colors, alert the user they were reached, and increment a score once a user was within two meters of the object. This was the final results of the course. Many Apple libraries were used and learned about during this course including ARKit, SceneKit, and CoreLocation. A strong understanding of these libraries was developed and put to use in a meaningful way.