

Capstone Group 38: Fall Term Retrospective

Section 1:

User guides and do-it-yourself step by step instructions are an extremely valuable resource to those interested in repairing things without going to a business. Currently, sites such as Chiltondiy provide a method for hobbyists to access manuals, documentation, and step by step guides, but only provide one size fits all guidance. Our team seeks to create an application which will provide users with augmented reality views directing them through steps for repair or maintenance. The application will function as a proof of concept for a larger scale project incorporating a larger variety of instructions and functionality.

Section 2:

After Sprint 1, where the goal of the group was to create a primitive app that processes video using the iOS ARDevKit library the team stands ahead of this goal by a large amount. The team was able to complete Sprint 2's goal of further developing the app created in Sprint 1 to recognize an object. Currently, the group has an app called "remote_identify" that is able to not only identify an air filter on a specific engine block, but also project 3D objects on a specified position. After surpassing Sprint 2's goal, the group has decided to move to Sprint 3 in order to reassign tasks. Sprint 3 is focusing on further development of the image recognition app by being able to recognize every individual part of an entire system (engine block or box of books) and then highlighting each part after a user clicks an interface button. The group has agreed that Sprint 3's goal is doable over winter break, allowing the team to get ahead in order for full development of the app to be completed by Winter Term. Currently, there seems to be no change necessary in project scope.

Section 3: Problems that need resolving. Use this section to describe any problems that have impeded your progress, with any solutions you have. This section might also include a summary of resources you might need and a deadline for securing those resources.

One problem that our team has run into is issues with development tools that require a Mac device or a service providing a simulated one. Some of our team members have had issues with the MacInCloud service and developing on it is often less smooth than on personal computers. A possible solution to this could be access to physical Mac devices, currently $\frac{2}{3}$ members have access, but getting access for our last member would be expensive.

Another problem that our team has run into is determining tools that will allow us to recognize individual components of objects. However, one of our team members recently put together a demo of a tool that matches objects based on provided models, which may provide the solution. Our team plans to explore this tool more and ensure it will fulfill our needs.

One more problem our team has run into is time constraints. Several of our members have run into issues with having enough time to work on the project, especially during busy

weeks with other courses. A solution to this problem could be for members to schedule out time for working on the project ahead of time, so that there are less conflicts.

Section 4: Project highlights. Feel free to show off anything you've accomplished that might boost confidence in your team's likelihood of success. For example, you might include interesting pieces of code (if coding is involved) or links to a pre-recorded demo.

Thus far, our team has made progress in developing the methods that we would like to use for our image tracking and gyroscopic tracking. Since we're developing our project from scratch this term was mostly focused on solidifying our design choices so that we can begin to create our project.

Recently, we found tools that will allow us to track an object based upon images that we provide. This is a great development that will allow us to refine our search towards how to best optimize for this technology. Whereas before, we debated how to make the tool, now that we have a version of what we want accessible we can focus on how to prepare our images to the best outcomes.

Here is a video taken by our team member Soren Anderson showing the aforementioned tool:
<https://drive.google.com/file/d/1xzu2k7Olc0xQtr7Gg2lrqzBX-2iCnLv/view?usp=sharing>

Aside from this development, we are beginning to look into analyzing other objects aside from the engine of a car. We believe that if we can refine our methods then hopefully we can find a system that will work for cars and also be easier to test as it won't require access to an automobile. Also, if we can get the method to work on ordinary objects then perhaps the tool will be transferable for other uses as well.

Section 5: Brief summary of design review feedback. Please note, if you did not receive written feedback from your design reviewers, simply summarize the verbal feedback you received during the live session.

The feedback that we received from the design review informed us that we should find a way to map colored objects on top of areas that we have identified. Luckily, the individuals that gave us feedback felt that we were making good progress and as a team we are reassured by this feedback. One thing is that they recommend that we find a way to ensure that the application can switch between tracking multiple objects in a seamless way. This is one area that we have not begun to approach so we'll make sure to keep this in mind during development.