

Project progress vlog #4 requirements

Preliminary

Your capstone vlogs are all to be posted on your team's GitHub and URCourses team project wikis by the due date (timestamps will be confirmed). This team vlog will reintroduce your team and selected projects to the world and discuss your progress thus far as per the guidelines below. With respect to vlog duration, **think a minimum of 8 minutes to a maximum of 15 minutes in length.**

Due: February 4, 2021, @ 2:30 pm in your team's GitHub and URCourses team project wiki (under "Vlogs" - post a link to your video)

Team member (re)introductions

Avery Cameron: Project Management/Flexible Developer

- Manage our GitHub structure and CI/CD
- Record meeting minutes
- Organize project meetings and milestones
- Organize meetings between URStreamSight and mentors
- Manage project documentation
- Help with Front-End and ML as needed

Raymond Knorr: Lead UI/API Developer

- Lead API and Front-End Developer
- Manage integration and documentation of our software with Prairie Robotics
- Manage Trello board for workflow organization
- Manage communications between URStreamSight & PrairieRobotics

Noah Rowbotham: Lead Machine Learning Technician

- Lead development of classification model and documentation
- Understand how to integrate with and operate within Amazon SageMaker and other products
- Work with the Aaeon boards used for operating the cameras on recycling collection vehicles

Although we have defined roles, we intend to provide insight and support to each other regarding all other aspects of development during this project.

Brief project blurb

What is URStreamSight?

We intend to produce a software solution that will monitor the quality of municipal recycling and give meaningful feedback to the municipalities. Our project will identify contaminants when curbside recycling is collected to provide analysts with

neighborhood specific data on contamination in recycling. With this information, municipalities can deliver targeted education to reduce contamination in recycling streams and increase the quality of recycling.

Scrum dates

State the start date and end date of this scrum

This scrum started on January 21 and ended on February 4.

Status description

As a team, provide an overview of the project's current status (green=good, yellow=slightly off track, red=off track). If the status is yellow or red, indicate:

- The reason(s) that the status is yellow or red
- The planned action(s) that will bring the project back to a green status.

Overall status: Green

API Status: Green

A lot of work has been done setting up the API to be functional and scalable using NestJS. We have implemented a testing database with various seeding data that is being used by our unit/integration tests for the API. Additionally, RBAC is set up for all endpoints.

Testing Status: Yellow-Green

We have our database test values setup and validated. We have started our testing and are working on finalizing our test plan. This will provide confidence in the code we have written and reduce long term errors. We are meeting with Dr. el-Darieby to confirm our test plan and receive feedback on how to improve our testing process. We are also going to add coverage checks and coverage criteria to our CI/CD pipeline as we add tests. We have a good plan going forward and need to execute on it which is why it is Yellow-Green

Frontend Status: Yellow-Green

Not much work has been done on the front-end since before christmas, as the majority of our efforts have been spent expanding and integrating the API with Prairie Robotics, and our Machine Learning pipelines. After we set up endpoint tests for the API, more time will be spent developing the front-end again. This is yellow-green as we feel it is mostly on track but will need additional work to be fully on track.

Machine Learning: Green

We have trained a bin detection binary classifier that is used to create the training data for our contaminants classification model. We have two camera angles that we use in the waste collection vehicles, we call them top and rear. The top camera views the entry of the vehicle's hopper and has the best view of the arm/bin being raised and lowered in and out of the vehicle. The model classifies whether the bin is present or not based on this view.

Most recently, our newest iteration of the bin detector model was trained. We have adjusted the position/angle of our cameras and now get a more useful angle from the rear camera. We further trained the original bin detector model on new images from the rear camera. It achieved a 100% accuracy with no false positives on our testing set.

Image Pipeline: Yellow

With the development of a bin detector model, we are now using that model to 1) create training data from a backlog of video already recorded and 2) have a script that operates on the onboard computer using the model that will actively detect bins and therefore allow us to directly upload training instances to our cloud storage rather than constantly process video. This task is currently yellow because ideally we would be recording training data directly from the truck as of this week, but it is currently not ready to be deployed.

Team members must also individually speak to their contributions over the stated scrum dates. What did everyone do to contribute to where the project is at? NOTE: I want to hear (and hopefully see in the video) team members in the video (this is about professionalism here folks)

Ensure to address any comments that came up in the previous scrum/meeting time

Avery:

Over this scrum I was working with Ray on the API creating endpoints and meeting with Sam to verify various design decisions. I also worked on generating seeding data for the database and ensuring that the values were valid to give us confidence when testing. I researched testing and started to implement some basic tests. I also worked on a Rationalization doc that we are using to track major decisions and keep track of research of alternatives.

Ray:

As Avery mentioned, I was mainly working on fleshing out the API with full-scale RBAC on all endpoints and developing seeding data for the test database. I also was working on a task to set up an interceptor that would see responses from any endpoint that updates the database, and keep track of who changed which entity in a separate table. This table will be used for auditing purposes.

Noah:

(same as above)

Comments:

Our scrum comments were positive and we have continued working as normal. The comment seemed to be cut off on testing so there may be something we missed there.

Project issues

List any issues from the Issue Log that are significant and should be shared with the audience of this report. If any related work has been done or decisions have been made, a summary should be provided.

We haven't run into any significant issues during this scrum.

Project changes

List any project changes that were approved since the last vlog, team/instructor scrum, or project bazaar day

We haven't had any project changes to address.

Project demo

Demo what ya got working as-is

Ray shows API and tables in MySQL Workbench Avery shows seeding data and tests

Next up

Discuss your team's plan for the next several weeks with respect to software design and development activities. Discuss the overall team plan but also **(again), team members must individually speak to their contributions that are planned by the next meeting (regardless if it is a project bazaar day, vlog, or team/instructor scrum)**

Avery: Looking at developing integration tests for every endpoint on the API with Ray, and additionally looking at integration of testing into the CI/CD pipeline, printing out a coverage report.

Ray: Implementing integration tests with Avery for the API, and additionally reviewing requirements of what's needed to be built on the front-end.

Noah: I will be getting the model to run on the Aaeon board, including linking a gps coordinate to bin tips and attaching a manifest file to the upload. Then my focus will shift to finalizing the data pipeline in AWS.

Team reflection

Does the team feel "on track"?

- Yes, we feel we are green overall and on track with our work. Having our API endpoints setup is a great help and the machine learning side is going well. We have some areas to work on coming up, like filling in tests and progressing the front-end, but are confident in what we can do.

What progress does the team particularly feel good (great) about?

- We feel particularly great about the API setup and finishing that off. We are also excited about the Machine learning pipeline and the results we are receiving for image sorting.

What barriers (if any) does the team feel is a current impediment to success?

- The standard ones: time and knowledge needed to develop acceptable models, processing power available for training. These are not great concerns however. We also are building three full-applications that are integrated with each other, and AWS, so the pressures of code-quality and time are very present here as well.

What help (if any) does the team require to move positively forward?

- We are going to talk with el-Darieby about the testing plan which will help us move forward with creating good code.
- Feedback on *** could be helpful to improve our project.

What questions or concerns does the team have (if any)?

- How should we handle any parts of the codebase that Prairie Robotics works on. It is a joint operation, so is it okay to have some sharing of work, or should it be kept separate for marking or overall project purposes? An example would be a Prairie Robotics member using our API for demonstrations and needing to add/change an endpoint to allow for his presentation.