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

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.

Show us what you got section

In September we started our project with Prairie Robotics with the creation of our project definition and decided that we will work to classify contaminants as they are put into a recycling truck. We also worked on documentation to make sure we have a strong understanding of the requirements, our project goals, business charter, timelines for deadlines and milestones. This documentation is available on our GitHub.

In the middle of October we received clarification and a scope redefine as changes to the API for image uploading and image capture hardware would be handled by Prairie Robotics. We completed lofi prototypes and received feedback before moving on to our HIFI prototypes at the end of the October. At the end of October we received questions that gave us insight into where our documentation and descriptions could be improved and worked on

creating documentation to provide clarification. Some of the items addressed included the perceived societal impact, the method of code integration with Prairie Robotics and notable scope exclusions.

At the start of November we had initial promising results for an object detection model and provided our Initial Project Architecture. **SHOW HERE IN VIDEO.** We were reminded to keep our focus on UI and UX, and for mid November worked on our empathy maps and user story maps to understand the user better. We also demonstrated our HIFI prototypes and CICD pipeline architecture ideas. At the end of November we had a basic CICD pipeline for linting and style guides, API endpoint definitions and had a frontend MVP with basic tables and a map.

We are now in the Acting phase and are continuing to work on the front end. We have started the implementation of a heat map by neighbourhood, created an Express API server with endpoints based on our earlier definitions, and have added additional endpoints as they were needed. We completed our AI project where we attempted to classify the TACO dataset of many images of litter using both Mask R-CNN and Yolov3. This process gave us insights into possible computer vision issues we may face in the future and how to solve them. We also better understand which deep learning models and data processing techniques are most valuable to us in the future.

Project demo (from lofi, to hifi, to coded MVP(s))

If you have done some project execution, demo what ya got! (keeping in mind your team might still be planning things out at this stage and might not have anything to demo)

- Front end
- API
- CI/CD Pipeline
- GitHub
- Machine Learning

Next up

Discuss your team's plan for the next several weeks with respect to software design and development activities.

- Christmas plans
    - Starting after finals we plan on getting more involved in development of a production level system for the front end and API. This includes integrating proper user authentication as well as hosting both services on AWS.
    - Additionally, we will begin developing a model using PyTorch that will be evaluated on TACO and once ready trained on data collected by Prairie Robotics
- January
    - Continue working on the production level versions of the Front-end and API, as well as dig more into the ML model with potential guidance from members of Prairie Robotics and our mentors.

Team reflection

Discuss:

Does the team feel "on track"?

- Yes, getting so much of the Front-End and API done allows the ML aspect to take on more focus in the new year, which it needs.

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

- Current state of the user-facing apps, as well as the ML knowledge we've gained from our AI project.

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.

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

- We are going to have continued communications with both Prairie Robotics and Dr. El-Darieby. Between both groups we should have all the guidance we need moving into January.
- We forgot to create a write-up for Tim regarding contacting a group that would know more about our privacy concerns. We will complete that write-up and follow up on this in January

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

- We are waiting for a response from the.... … regarding privacy standards which will influence the granularity of data that we provide to the municipalities through our front end