

Last Changed: 2021-04-08

Summary of Changes:

- Modified annotation portion of machine learning to reflect the purchasing of services from SuperAnnotate

## URStreamSight: PROJECT SCOPE STATEMENT

### Project Name

URStreamSight

### Project Deliverables

#### Initiation

##### Develop Business Case

Create a document to describe the project overall. Document the background of the project, business needs and opportunity, options, cost benefit analysis and final recommendation as to the selected project option.

##### Develop Project Charter

Create a document to outline the project goals, objectives and budget. Identify the project sponsor, manager, and stakeholders.

##### Develop Project Requirements

Create a document to outline the functional requirements, such as features or properties of project outcome, and the technical/performance requirements such as infrastructure or response time.

##### Develop Risk Analysis

Identify risks for the project and assess them with the probability of the risk occurring, the impact of the risk and the overall score.

##### Develop additional Documentation

Create additional documentation for the communication plan, project roles and responsibilities and stakeholder analysis. Create more documentation as required.

#### Planning

##### Plan Budget

Identify potential costs involved with the project and budget based on the available resources.

##### Plan Schedule

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Plan the schedule for the project documentation and API research.

### **Plan Milestones**

Plan out project milestones for research, documentation, API, front end, machine learning and other activities.

### **Research API options**

Research and document API options and alternatives. Identify pros and cons of each approach giving extra consideration to maintainability, ease of development and readability.

### **Plan API**

Plan out simple endpoints and guidelines for the MVP of the API.

### **Lofi designs**

Create lofi designs of the frontend, multiple designs of each page to be considered.

### **Hifi designs**

Review the lofi designs and feedback from them and combine them into a cohesive hifi design to serve as the front end MVP.

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## **Executing**

### **Create API**

#### **Build Prototype system**

Build a prototype API MVP to be used to demonstrate basic endpoints and project setup.

#### **Add preliminary endpoints**

Add basic additional endpoints to the API for front end functionality.

#### **Integrate with Prairie Robotics**

Integrate the API with Prairie Robotics repository and libraries.

#### **Add additional endpoints and RBAC**

Add additional API endpoints based on design and requirements and add RBAC to every endpoint.

#### **Add Tests to endpoints**

Add integration tests to the API to ensure reliability of the API endpoints. Test using Jest and run with Nx.

#### **Deploy to AWS**

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Deploy the API to Prairie Robotics on AWS for hosting.

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## **Create Frontend**

### **Create Initial Pages**

Build a prototype front end MVP to be used to demonstrate basic UI and project setup.

### **Add preliminary pages**

Add basic pages to the front end to showcase potential functionality.

### **Integrate with Prairie Robotics**

Integrate the front end with Prairie Robotics repository and libraries.

### **Tie in Front end with API**

Tie in API calls to the front end to access test data for a more realistic front end..

### **Add Additional Front end pages**

Add additional front end pages to increase usability

### **Deploy to AWS**

Deploy the front end to Prairie Robotics on AWS for hosting.

## **Machine Learning**

### **Research machine learning pipeline**

Research and machine learning options and potential pipeline processes used for machine learning.

### **Implement Bin detection tracking**

Implement bin detection to process video from bin pickup and tipping into a collection vehicle.

### **Leverage Annotation Support**

Send images to SuperAnnotate to speed up the annotation process.

### **Train initial machine learning model**

Train initial machine learning model for contaminant detection.

### **Train machine learning model**

Train/continue to train model for detection using additional images and updated model setup.

### **Deploy machine learning model**

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Deploy the model to Prairie Robotics on AWS for hosting

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## **Closing**

### **Finish remaining dev work**

Finish any remaining development work and finish off features and identified bugs.

### **Finish Documentation and Report**

Update and complete documentation for the project, work on design explanation documents and the final report.

### **Transfer Project**

Transfer the project to Prairie Robotics and finish the project.

## **Project Exclusions**

The setup of hardware in the collection vehicles will not be included in the scope of the project, this will be done by Prairie Robotics. For the machine learning image capture, some setup of the machine used will be completed but not the actual physical installation.

The identification of contaminants would be at the point of collection. This is an identification system only and the contaminants will not be removed from the stream. It does not function outside of the collection vehicle and will not be used in the recycling facilities themselves.

The app will only be web based and a mobile app will not be created. The project is for use by municipality analysts and not the general public at the moment. (This may be done by Prairie Robotics in the future but it is not the focus of this project at this time).

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