**URMC** **Ventilator Allocation: Project Charter**

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DSCC 483: Data Science Capstone

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01 March 2022

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### Project Summary Information

* *Project Title*: URMC Ventilator Allocation
* *Project Start Date*: 09 February 2022
* *Project Finish Date*: 01 May 2022
* *Project Manager*: Derek Caramella

### Project Vision

URMC wants to assess the standing ventilator allocation process, then improve or sustain the methodology to increase the number of lives saved.

### Project Scope

Gantt Chart

### Preliminary Milestones

1. Create Project Charter
2. Convert raw comma-separated values files into a PaaS hosted database
3. Deliver a Poltly Dashboard hosted on a PaaS system
4. Create a Flask application for death ventilator model
5. Create death discrimination model
6. Deploy models to Flask

### Budget Information

Gantt Chart

### Success Criteria

The University of Rochester team successfully answered in an interactive and under stable way:

1. Are there demographic disparities in survival outcomes?
2. Is initial triage priority predictive of survival?
3. Are there demographic disparities in the predictive value of initial triage priority?

### Approach

The University of Rochester team will evaluate discrimination by utilizing a logistic, support vector machine, linear regression, naïve bayes decision tree, and/or random forest.

* Logistic Regression
  + A statistical classification model that in its basic form uses a logistic function to model a binary dependent variable. We will utilize one-hot encoding and interaction variables to model ventilator acquisition and death.
* Naïve Bayes Decision Tree
  + A statistical classification model that utilizes categorical, discrete data to model a dependent variable. If this method is utilized continuous variables (age) will need to be binned.
* Random Forest
  + An ensemble learning method for classification that operates by constructing a multitude of decision trees at training time. The output of the random forest is the class selected by most trees. Similar to Naïve Bayes, categorical variables are required.
* Support Vector Machine (SVM)
  + The support vector machine can classify binary and multinomial dependent features. SVM uses a subset of training points in the decision function (called support vectors), so it is also memory efficient.

The University of Rochester team will deploy a Flask application with a Plotly Dashboard to pythonanywhere PaaS[[1]](#footnote-1) to provide model interaction and visualization.

### Roles & Responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Role/Stakeholder | Contact Information | Signature |
| Derek Caramella | Project Lead & Web Developer | (315) 532-7782 | Derek John Caramella |
| Ezgi Sirr Kibris | Machine Learning Engineer |  |  |
| Nefle Nesli Oruc | Database Administration & Deployment Manager |  |  |
| Walter Burnett | Data Engineer & Machine Learning Engineer |  |  |

1. Platform as a Service [↑](#footnote-ref-1)