# 1. Problem Identification (3%) - Nico

# 2. Project-related Background and Research Review (3%) - Nico

# 3. Design Process (3%) - Navjot

# 4. Scenarios and/or Use Cases (5%) - Navjot

# 5. Stakeholder Requirements and Traceability Matrix (10%) – Jeff

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| Req ID# | Req Type | Requirement Source | Requirement Specification |
| RQ1 | Client | “This project requires students to design and develop an image processing algorithm..” | The development of an object detection algorithm (ODA) is integral to the project. |
| RQ2 | Client | “…that can detect and classify objects and obstacles for the 8x8 Electric Combat Vehicle.” | The ODA must be able to identify and categorize individual objects in a real environment. |
| RQ3 | Client | Such techniques may include, but is not limited to, convolutional neural networks and other deep learning options. | The ODA must be capable of identifying a large variety of objects, both large and small scale. |
| RQ4 | Client | Such techniques may include, but is not limited to, convolutional neural networks and other deep learning options. | The ODA must be capable of identifying a large variety of objects, both large and small scale. |
| RQ5 | Client | ”…The algorithm must be compatible with ROS (Robot Operating System)” | The ODA must support an interface that the ROS architecture can utilize. |
| RQ6 | Client | “The algorithm should be efficient and robust and must exhibit high repeatability.” | The ODA must perform its tasks in an acceptable amount of time, and must operate in a stable state machine framework.  Since ROS does not operate in real time, neither can ODA. |
| RQ7 | Client | “Sourcing of compatible sensors and controller hardware for compact packaging and deployment.” | The ODA must utilize sensors and controllers that is compatible with ROS. |
| RQ8 | Client | Write C++/Python code for Obstacle Detection and Classification | The ODA must be developed to be compatible with ROS, so it must be written in either Python or C++ as the programming language. |
| RQ9 | Client | Conduct testing and validation in both simulated and physical environment. | The ODA must support both simulated and physical implementation of the algorithm. The ODA must support testing and debugging in both simulated and physical environments. |

Table 1A – Requirements Specification

# 6. Definition of Acceptance Tests (3%) - Soso

# 7. Project Plan (3%) -

# 8. Contribution matrix –soso