# Software Project Management Plan

## Introduction

### Project Overview

The purpose of this project is to implement an autonomous vehicle with no human interference using image processing for object detection and Arduino for hardware control. This project has been inspired by the creation of driverless car designed by Google. This project is being executed as part of our final year curriculum. The expected delivery date is 20th February 2016.

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| Sr. No. | Deliverables | Description | Delivery Date |
| 1 | Documents | SPMP: Software Project Management Plan  SRS: Software Requirement Specification  Progress Report  Literature Survey | 19th November 2016  19th November 2016  19th November 2016 |
| 2 | Executable Code | * Code for Background Subtraction   + Using Video   + Using still image * Traffic Signal Detection * Road Sign Detection * Arduino-Matlab Interfacing Code * Object Detection Code | 26th August 2016  19th November 2016  30th December |
| 3 | Datasets | Sample video for testing | 19th November 2016 |
| 4 | Hardware | The Prototype Hardware Model of the autonomous car | 20th February 2016 |
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### Project Deliverables

## Project Organisation

### Software Process Model

Prototype and Iterative Model

**The Hardware Component** of the Project will be using the Prototyping model under the evolutionary Process model.

The flow of information and work products:

Communication: Discussion about the work product and the deliverables along with different techniques and methods to be used for the deployment and construction of the required deliverable among the developers and the guide.

Quick Plan: Sketching of the initial design of the prototype (including the software structure and the hardware structure).

Quick Design: Selection of all the appropriate hardware components taking into consideration all the restraints on the system like the size, power requirements, execution and space complexity and the external environment.

Construction of Prototype: Assembling all the identified and verified hardware components to construct a prototype model on which the software will be executed.

Deployment, Delivery and Feedback: Deploying the robot to near-actual conditions and recording its response. The response recording will include the efficiency of the hardware components, their proper functioning to the software signals, checking the accuracy and robustness of the hardware components.

Software Component:

The Software Component of the project will be using the Iterative Process model as the software building and optimization is a repetitive process and will continue till the final deliverable.

The flow of Information and work products: Information in form of integrated code and datasets will be carried forward with each iteration of the model. The work products will be based on this information; i.e. the hardware on which the software is executed will be improved with each iteration and with deliverable after every iteration it will include a new feature.

Review to be conducted: The working of the deliverable at the end of each iteration will be review for its accuracy and efficiency, along with the checking of function requirement the module is supposed to satisfy. This review will be done by the developers and guide.

Major Milestones to be achieved:

1. Construction of Robot according to the planned design
2. Finalization of Datasets
3. Hardware Software interaction and information relay (Arduino-MATLAB interaction library)
4. Execution and Testing.

Versions to be established: Versions of the Hardware working module will be released (Within the developing team) as a part of individual feature integration and development.

Project deliverables to be completed: Project deliverables will be the same as mentioned above.

### Roles and Responsibilities

The team consists of four members:

Poonam Bhogle (Project Guide)

Aditya Godambe (Project Planner/Designer)

Ashutosh Mahajan (Project Developer)

Chinmay Karanjkar (Project Tester)

### Tools and Techniques

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## Project Management Plan

## Tasks

1. Tools and resources gathering
2. Requirement analysis
3. System Design
4. Development of an exploratory prototype and getting feedback

Task 1: Tools and Resource Gathering

1.1 Description

All the main requirements of the project both hardware and software are collected in this task. The hardware requirement gathering process will include identifying the correct microprocessors, motor drivers and all the other basic robotic components; Installation of Matlab software and Arduino IDE. It also involves finding relevant technical papers containing algorithms which shall be used for implementation.

Deliverables and milestones

1. Finding relevant technical papers containing algorithms which shall be used for implementation.
2. Resources needed
3. Web resources
4. Laptops/PCs
5. Access to IEEE Explore library

Dependencies and Constraints

None

Risks and Contingencies

None

2. Requirements Analysis

Description

Identification of prime functional requirements

1. Obstacle detection
2. Traffic signal and road sign detection
3. Appropriate robotic movement in accordance to the first two requirements.

Software documentation such as SRS, SPMP and STD and hardware feedback logs.

Deliverables and milestones

1. Delivery of the current drafts of SRS, SPMP and STD.
2. Complete understanding of all the requirements by the group members.

Resources needed

None

Dependencies and constraints

Requirement analysis cannot be started until detailed meetings have been conducted with all relevant stakeholders and constraints have been specified.

Risks and contingencies

Possible risks are unclear, less or miscommunication between the technical team and the stakeholders.

1. System design

Description

This task primarily involves the chassis design of the robot and