PROJECT SCOPE STATEMENT

Project Title: Artibot **Date Prepared:** 26.09.18

Product Scope Description:

Develop a self-driving autonomous vehicle which can drive in test environment but not in commercial roads.

Project Deliverables:

Technical

- Image recognition of road lanes
- Self-driving mechanism

Documentation

- Requirement Documentation
- Prototype Results
- Test Results

Project Acceptance Criteria (in scope):

- Recognize road lanes
- Be able to drive between the lanes for 10 seconds or more before it goes out of lane.
- Finish and deliver the Project before May.

Project Exclusions (out scope):

- Battery
- Real life environment (pedestrians and bicycles)
- Speed and acceleration
- Weight
- Vehicle shape.

PROJECT SCOPE STATEMENT

Project Constraints:

Project constraints are defined by our budget and team.

- The team consist of five members from different engineering disciplines.
- The budget for our project is 154203.5 NOK
- Limited knowledge regarding AI
- Time

Project Assumptions:

Our team focuses on not developing the car itself but develop the learning algorithm for the self-driving part, which is reinforcement learning. We will use image recognition to detect the lanes and not develop an algorithm for object detection.

Key Stakeholders	
Stakeholders	Description
Employer/The Product Owner; Aurilla A. A.	Direct source of the key requirement
USN	Makes regulation and rules for the development of the project to follow
Artibot	The development team for the project
Investors/sponsors	Provides the financial investment to the project
Suppliers	Provides the equipment and components of the product

Project Artibot

Physical resource:

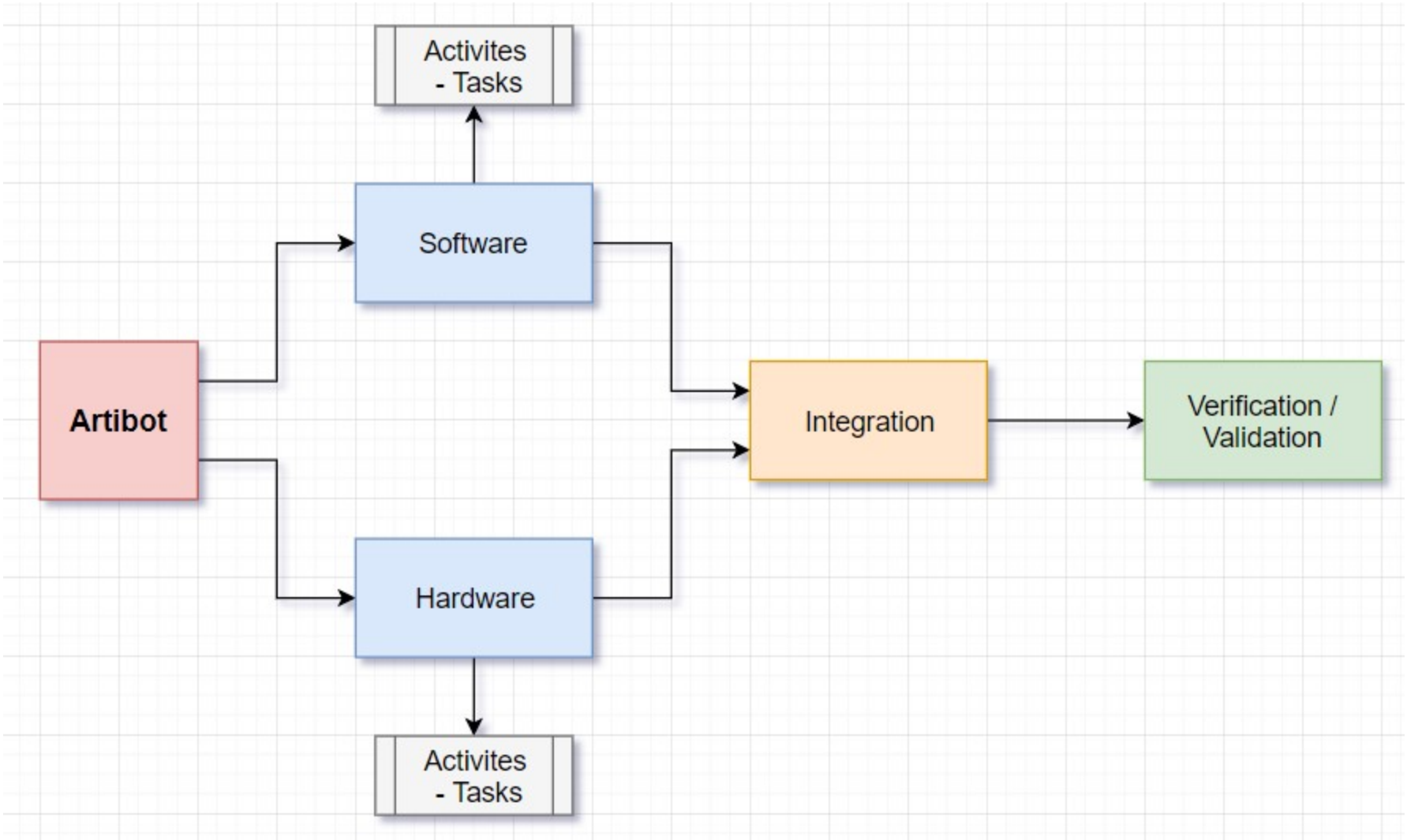
- Lab car prototype.
- Rechargeable Batteries
- Personal PC's
- Jetson TX2
- On board camera
- Sensors
- 2x GTX 1070

Software resource:

- Anaconda
- Matlab
- Visual studio
- Tensorflow
- Keras
- Sharelatex
- Github
- Ubuntu

Human resource

- Development team
    - Huseyin (SM)
    - Bozhao (Ar)
    - Chrisander
    - Bilgehan
    - Eivind (APO)
- Supervisors
    - Pr. Aurillia
- Consultant:
    - Pr. Dag
    - Pr. Antonio
    - Pr. Tad
    - Pr. Kiran
    - Pr. Bhuvan


Activites
- Tasks
Software
Artibot
Integration
Verification /
Validation
Hardware
Activites
- Tasks

RISK MANAGEMENT PLAN

Project Title: Artibot **Date Prepared:** 27.09.18

Methods and Approaches:

Risk Analysis

Tools and Techniques:

- Risk Analysis Matrix
- Characteristics: Probability, Severity and Impact.
  - The Impact describes the level of risk and is calculated in the matrix by Probability * Severity.

Risk Categories:

- Human factors
- Business
- Technology

#	Risk	Description	P	S	I	Mitigation	Action to take
01	Computer crashing	Likelihood of any computer we use crashing	**1**	**5**	**5**	Work on more than a single computer	Computer needs to be repaired immediately, and we need to continue to work on another computer
02	Testing environment	No environment to perform the testing	**3**	**4**	**12**	Apply room as early as possible	Rent a commercial rental room
03	Data loss	If the project documents gets deleted or corrupted	**1**	**5**	**5**	Backup of all documentation in either Google Drive, Local hard drive, etc.	All documentation must be rewritten as fast as possible
04	Absence	Absence of a team member	**5**	**2**	**10**	Make sure that we are not too dependent of a team member	Notify the other team members and divide the tasks
05	Lack of knowledge	Team member lacks technical knowledge to implement a system	**4**	**2**	**8**	Make a plan on which materials we need to learn beforehand	Ask other students/teachers and start learning the insufficient knowledge from the internet
06	Global standard	The car provided by the school might not follow the global standard	**3**	**4**	**12**	Buy components that is following the same certain standard	Buy interface to adapt to the predefined standard
07	Poor requirements	Stakeholder or system requirements might change	**3**	**3**	**9**	Apply Scrum methodology to be agile	Refine the product backlog and add the new requirements
08	Computer compatibility	Software do not support the computer you use	**2**	**3**	**6**	Read the system requirements of the software	Find a new computer that supports the software
09	Budget	The project's cost exceeding the budget given by the investors	**4**	**2**	**8**	Create a good budget plan and make sufficient research of components	Negotiate for a higher budget
10	Group dynamic	Disagreement within the group regarding project and poor working environment	**5**	**4**	**20**	Have a transparent environment and active communication	Scrum master call an additional meeting to resolve issue

Table 1: Lists of risks

P. = Probability, S. = Severity, I. = Impact

Impact	Risk
1 - 3	Minor risk
4 - 7	Low risk
8 - 12	Moderate risk
13 - 18	High risk
19 - 25	Extremely high risk

Table 2: Risk categories

		Probability				
		1	2	3	4	5
Severity	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5

Table 3: Risk matrix

Three point estimates								
		quantity	Optimistic cost	Most likely cost	Pessimistic cost	Weighting equation	Expected cost est.	total estimate
GPU	RTX 2080 ti	4	12000	13500	15000	(OC + 4*MC+PC)/6	13500	54000
On board pc	TX2	1	3560	4560	6000	(OC + 4*MC+PC)/6	4633.333333	4633.333333
Battery	ZOP Power 14.8V	1	250	350	400	(OC + 4*MC+PC)/6	341.6666667	341.6666667
Frame	RC Car Chassis	1	700	1000	2000	(OC + 4*MC+PC)/6	1116.666667	1116.666667
Motor	DC Motor	1	350	900	2000	(OC + 4*MC+PC)/6	991.6666667	991.6666667
Wheels	Rubber tires	2	250	300	450	(OC + 4*MC+PC)/6	316.6666667	633.3333333
software	sharelatex/visual sudio	4	15280	16880	25760	(OC + 4*MC+PC)/6	18093.33333	72373.33333
Sum			114480	128930	174340		134090	**134090**
							Budget	154203.5

Story cards & Visible wall

https://github.com/Artibot/Autonomous-Car-CHEBB/projects/1