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TEAM AURORA | YILDIZ TECHNICAL UNIVERSITY

International UAV Competition

FLight science 2 class project

# Statement of Work

## Intro

This project contains the modeling and simulation of a quadcopter for Teknofest competition. Yıldız Technical University, Applied Sciences Faculty, Aviation Electrical and Electronics department second year students are involved in this project. As an external factor, AURORA UAV competition team is affected by this project as means of design and simulation needs.

## What is The Purpose of This Project?

The purpose of this project is to construct a simulation environment for quadcopter to test in different situations. Deliverables are the report, simulation model, design model and other files. (scripts, models) Objectives are to construct a simulation environment, run the simulation and obtain the results. Also another objective is that to try different equipment choices and find the optimum solution with the help of software applications. Due to optimum solution, making simulation is required. Since this is a nonprofit simulation project, the return on investment is hundred percent.

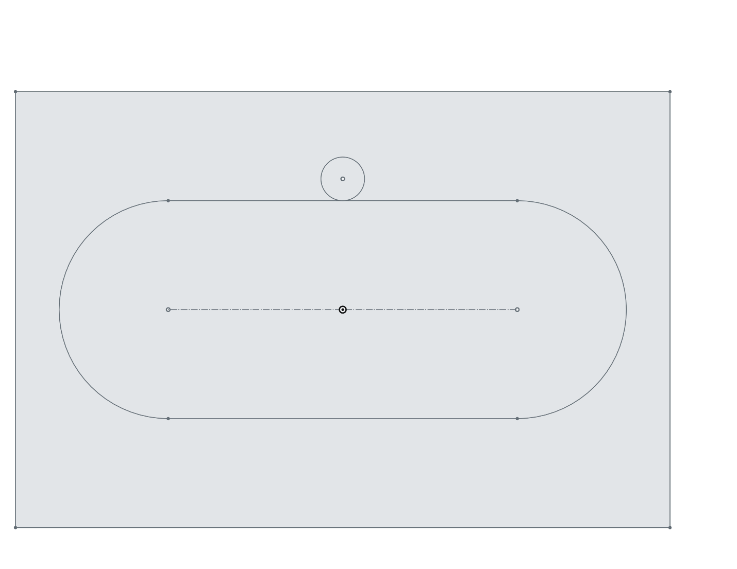
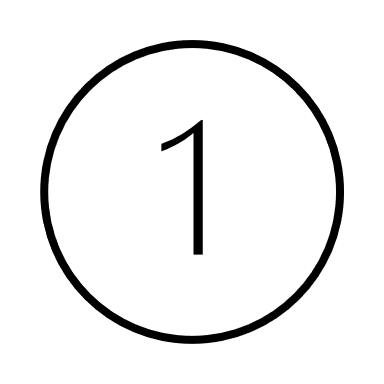
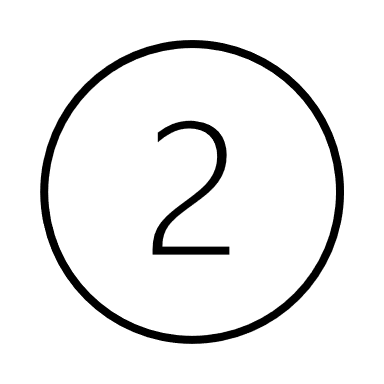
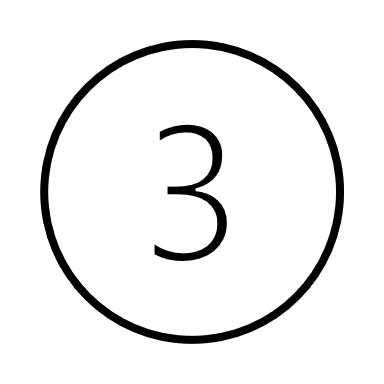
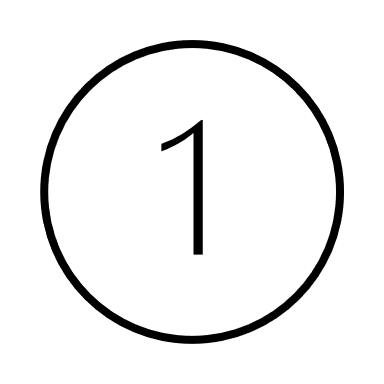
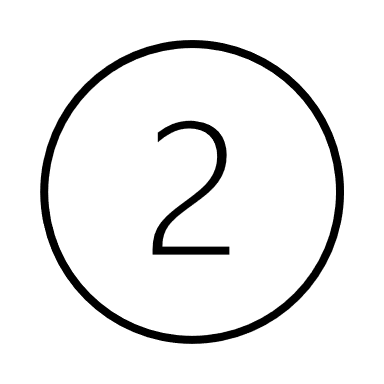
## Scope of Work

Simulating a quadcopter is needed in this project. This requires software options such as: MATLAB, Simulink, Stateflow. Also, some external CAD design tools might be used minimally. For the aim of completing the simulation, we need to use the half of V diagram. Outcomes are an simulation environment that might be used for live competition testing, scripts for testing different kind of models and finding the optimum configuration. Nearly 2 months are given for this project.

## Tasks

For competition wise, tasks are as following:

* As task 1, complete a lap which includes turning from 3 poles. This includes two 180 degrees turns and one 360 degrees turn. Make two laps in 5 minutes maximum. In detail:
* Take off from point A
* Make 180 degrees turn around pole 1
* Make 360 degrees turn around pole 2
* Make 180 degrees turn around pole 3
* Repeat previous steps for the second lap
* Land at point B
* As task 2, complete a lap which includes turning from 2 poles. This includes two 180 degrees turns. In lap 2, take water from red zone and deliver it to blue zone and complete the lap.
* Take off from point A
* Make 180 degrees turn around pole 1
* Make 180 degrees turn around pole 2
* Make 180 degrees turn around pole 1
* Take water from red zone (extra weight)
* Deliver water to blue zone (reduce weight)
* Make 180 degrees turn around pole 2
* Land at point B

gece göğü içeren bir resim

Açıklama otomatik olarak oluşturuldu

A

B

B

A

Figure 1- Task 1 Circuit Map Figure 2- Task 2 Circuit Map

## Milestones

|  |  |
| --- | --- |
| Project Start | 08/03/2021 |
| Project Finish | 07/06/2021 |
| Amount of Time | 93 days |

## Deliverables

|  |  |  |
| --- | --- | --- |
| Week | Date | Deliverables |
| 1 | 08/03/2021 | Project report page 1 |
| 2 | 15/03/2021 | Statement of work |
| 3 | 22/03/2021 | System architecture and system functions/ Use case scenario(s) |
| 4 | 29/03/2021 | Test cases to satisfy the requirements and pass/fail criterias at system level and user level  User Level Requirements / System Level Requirements |
| 5 | 05/04/2021 | Implementation (System level models, simulation with simple controls)  Components and Component Level Requirements (COTS - Use actual components) |
| 6 | 12/04/2021 | Component level models and simulations per requirements |
| 7 | 19/04/2021 | Component level models and simulations per requirements |
| 8 | 26/04/2021 | Subsystem level models and simulations per requirements |
| 9 | 03/05/2021 | Subsystem level models and simulations per requirements |
| 10 | 10/05/2021 | System level models and simulations per requirements |
| 11 | 17/05/2021 | System level models and simulations per requirements |
| 12 | 24/05/2021 | Design of experiments |
| 13 | 31/05/2021 | Design of experiments |

Table 1-Deliverables

## Schedule

The schedule is expressed in the later sections. But as a side note we need to express that some minimal time differences might occur at deliverables due to instructor choices. Also as another side note, it may be observed that in some weeks same deliverables are planned. In this situation, the reader needs to take the last date as reference. Before the last date in the table, introductory first date is in place.