PES University ECC

Control System (CS)

UE20EC251

Group Number: A4

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A Control System Design for the automation of UAV Turbine engine

INTRODUCTION

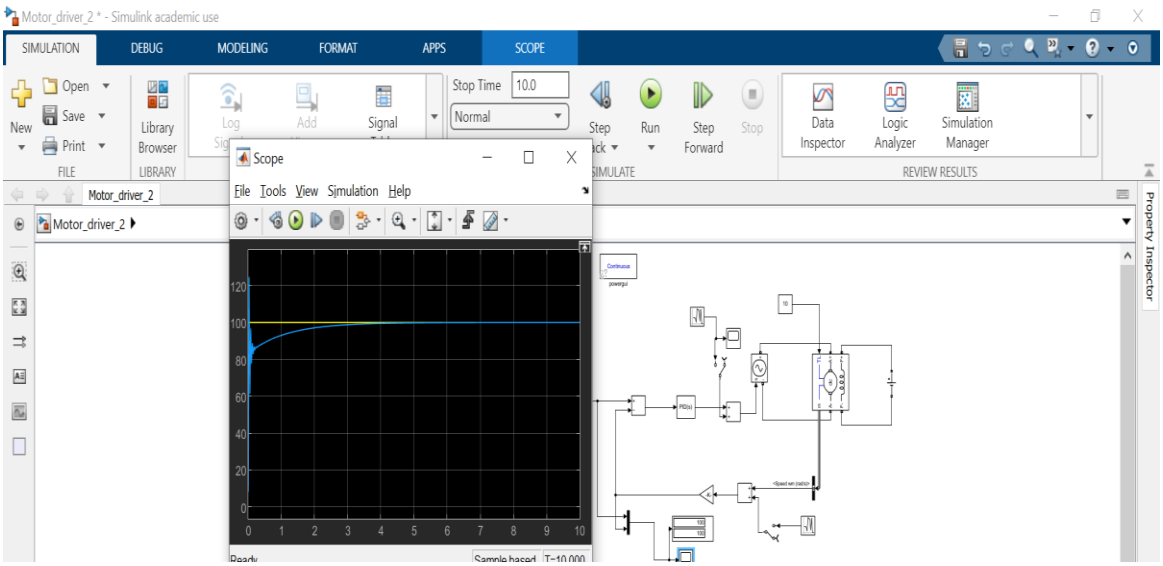
With the advancement of UAV (Unmanned Aerial Vehicle) in various domains, be it from military purpose to carrying vital organs/blood to remote hospitals UAV is taken over the time consuming and tedious job of covering long distance and simplifying the work/process. Today these vehicles are controlled from ground, but we seek to automate this process and reduce ground effort and reduce man power.

With modern autopilot and vehicle landing system out project seeks to build a subsystem that will maintain the electric motors to run in stable state and reduce the effect of noise caused due to natural and in-system causes we also seek to implement a digital control logic that will control the turbine individually.

Design and Implementation

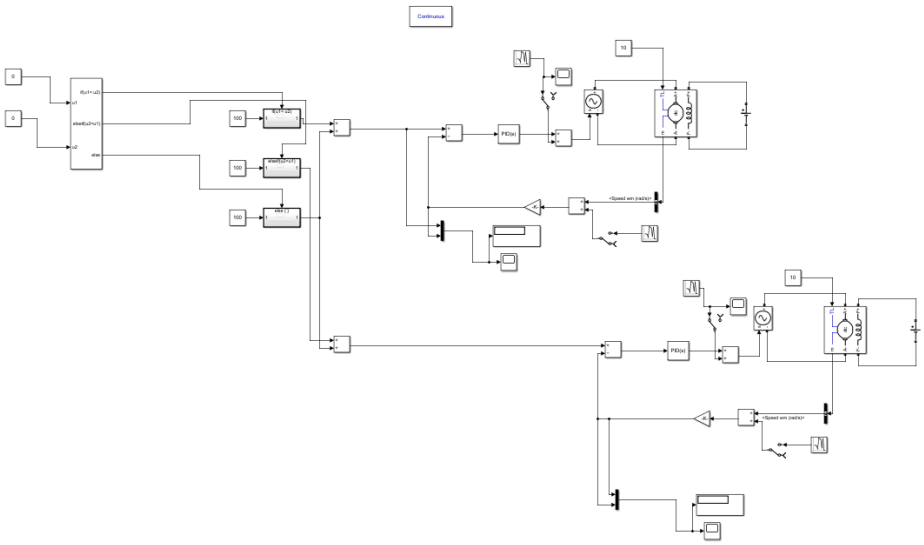
We have used the concepts of modern control systems to design a motor that reduces the effect of noise on the motor system and then connected another system that allows us to control each of the motor individually as well as both the motors at the same time.

The system is designed and tested in Simulink, the circuit and the results are shown below,



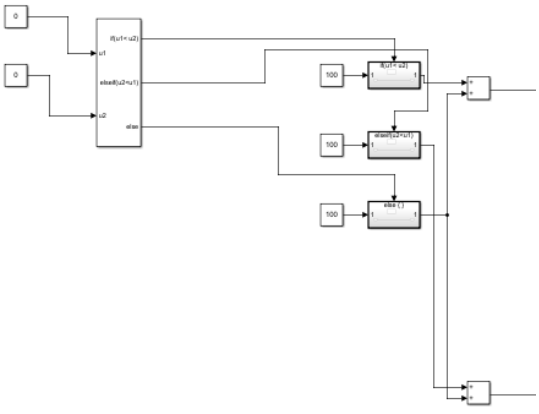
The above image shows us the closed loop working of our engine.

Now taking this further we implemented a digital logic that will enable us to control two of these based on the control signal from the master control system.



THE SUBSYSTEM

The above given figure gives us a overall idea of the circuit of out control system and the below given is the logic that drives the control system and the constant values provided after the condition block determines the speed of the motor again this can also be varied by the master control system but we have gone ahead and provide the values to the system.



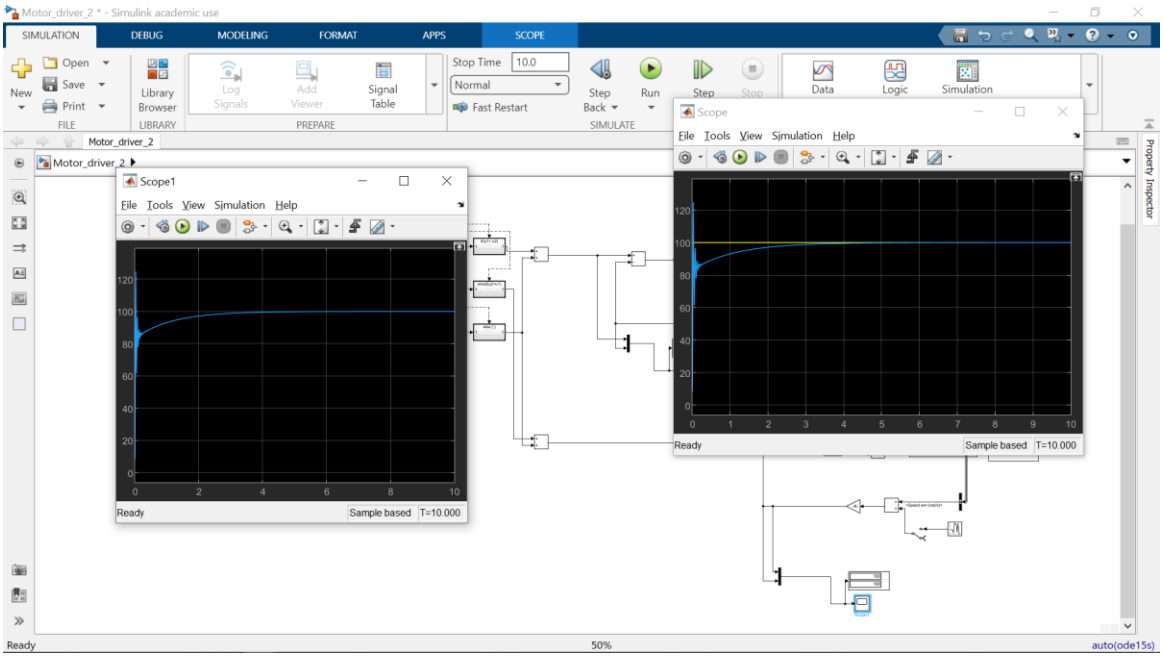
THE LOGIC

Here is the truth table that shows how our system works,

A	B	Motor 1	Motor 2
0	0	On	On
0	1	On	Off
1	0	Off	On
1	1	On	On

Case 1) A=0 B=0/ A=1 B=1

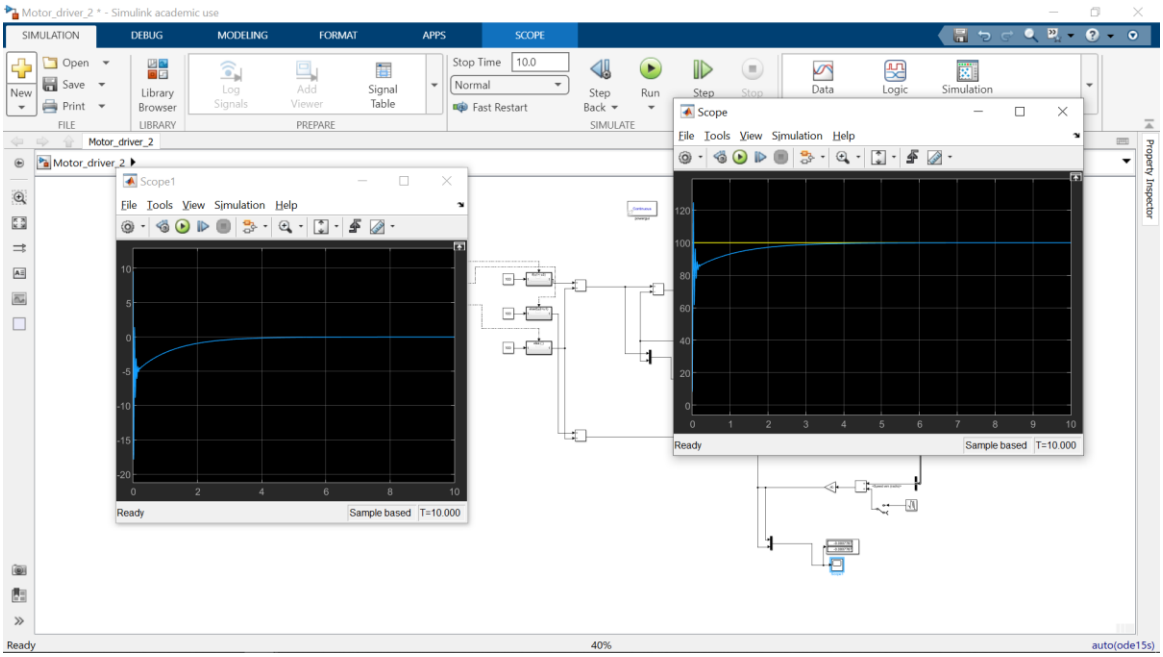
So, in this case both the motors are on and running,



We see that both the motor rotates at the speed provided in the constant.

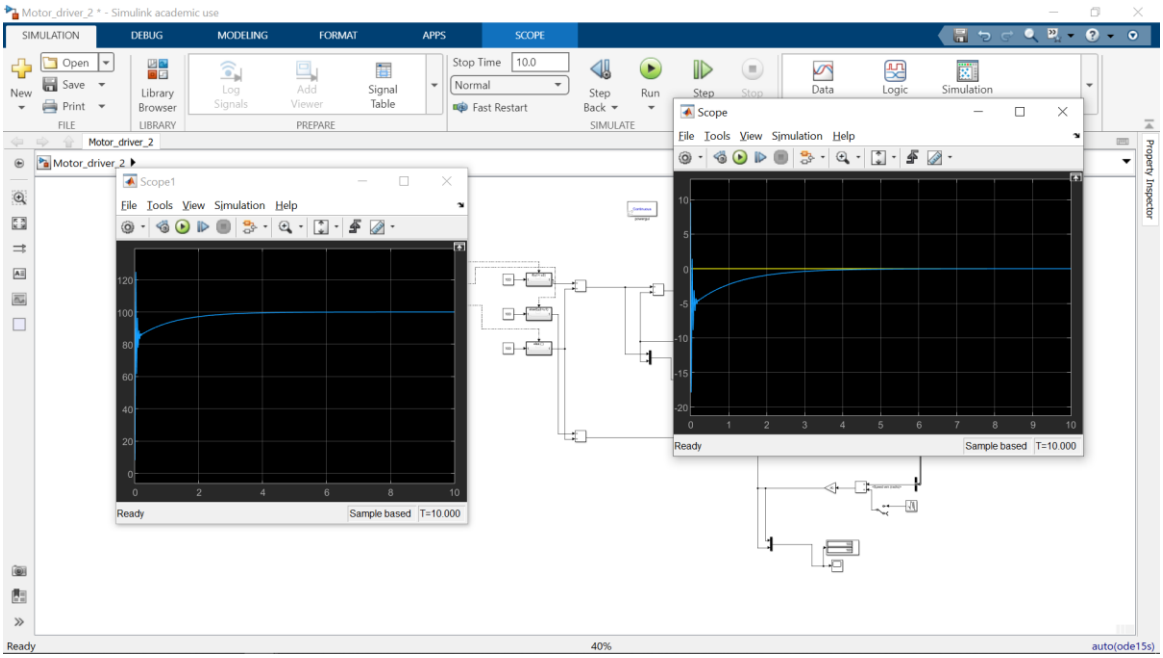
Case 2) A=0 B=1

For this case the motor 2 is off and motor 1 is supposed to be on.



Case 3)A=1 B=0

So for this case we want out motor 1 to be off and motor 2 to be on.



Conclusion

In this project we have successfully used the concepts that we understood from the course of control system and was able to implement it on a simulation. We have designed a PID controller and a digital logic the can help us implement the system and this concludes our project of using Control System Design for the automation of UAV Turbine engine.