
EYSIP 2020 Weekly Report

Saturday, 17.05.2020


Cycle BOT using LQR

Team 1 (LQR)

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Important Points

1. We read a number of papers on reaction wheels and Cyclebot.
 2. We got familiar with V-rep Software
 3. Mathematical modeling of the Reaction Wheel Inverted pendulum was derived.
 4. Some Test V-rep simulations were tested using Lua Script.
 5. 3d model of the Reaction Wheel inverted pendulum was created on Fusion 360.
 6. Understood the theory behind the placement of the reaction wheel on our robot.
 7. A report on finding the moment of inertia a body in Fusion 360 was made.
 8. 3d model of the Reaction Wheel inverted pendulum was created on V-Rep.
 9. K- matrix of the system was found out using LQR code in Octave.
 10. Lua Script for the working and balancing of the system was written and attempts were made to implement it.
 11. The algorithm for the Stabilisation of inverted pendulum was updated.
 12. Values of Q and R matrices were tuned to get stabilization of the Inverted pendulum simulation in V-rep.
 13. A [meeting](#) was conducted with mentors to give the report and ask queries.
 14. The model of reaction wheel inverted pendulum at a pivot point was created on V-rep.
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15. The code to stabilize the V-rep model with LQR was created.
 16. A meeting was conducted with mentors to give the report and ask queries.
 17. Design for cycle bot was finalized on fusion 360.
 18. Model of Cyclebot was made in V-rep
 19. Research for path planning in V-rep was done.
 20. Research for next week's work done.
 21. The compilation of reports was done.

Relevant Links:

- Simulation of pivot inverted pendulum in V-Rep ([Video](#)) ([V-Rep File](#)).
- Design of Cyclebot([Video](#)).
- [Simulation of Cyclebot in V-Rep](#).
- [Mathematical modeling](#) of Reaction wheel based inverted pendulum.