

AYBU Aerospace Engineering Department *presents*

Ramazan Yeşilay

Satellite Attitude Determination and Control System Current Literature

This study investigates developments in Attitude Determination and Control Systems (ADCS) for satellites, focusing on some new control methods released after 2021. Also in this study, ADCS the applications of Reinforcement Learning (RL) is examined. It initially examines traditional control applications such as PID, MPC, LQR, SMC and hybrid methods in ADCS. Various studies are given to show the use of these methods in satellite control with examples from current papers. The second part of the presentation pass on Reinforcement Learning, a method that can provide innovative solutions to complex control problems in ADCS. RL differs from traditional methods in that it allows the system to learn the most appropriate actions through trial and error, without the need for mathematical modeling for each scenario. Although the study does not delve into the mechanics of RL, it does explain how it works through cycles of action, observation, and reward to continually improve control policy. The potential of RL to improve ADCS is discussed in comparison with traditional methods. By emphasizing the flexibility and adaptability of RL in dynamic environments, it is suggested that it could be a promising alternative for future satellite control systems. This study aims to show the current applications of ADCS and to encourage further research and application in this innovative field.

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Location: B-911 (9th Floor Meeting Room)

About the Speaker

Ramazan Yeşilay is working as an expert in Technology and Innovation Support Programs Directorate at TÜBİTAK and currently pursuing a Ph.D. degree in aerospace engineering at AYBU. He received his B.S. and M.S. degrees in mechanical engineering from AYBÜ (2018 and 2021).