

AYBU Aerospace Engineering Department *presents*

Hüdai Erpulat

Designing and Range Optimization of an Air to Air Missile with Size Constraints and Terminal Phase Control by Lateral Thrusters

The rapid advancement of technology necessitates new requirements for the protection of airspace. For instance, new-generation fighters have internal weapon bays to decrease radar visibility. Therefore, the loading volume of modern fighters is considerably less than previous-generation fighters. To address this problem, defense companies are developing new generation air-to-air missiles that have a similar range with smaller size. Increasing the range of the missile requires new efficient rocket motor compounds and optimizing the stages and thrust curve while considering the requirement of high engagement velocity. Similarly, to achieve an effective design, a main objective of this work is to optimize the range of the designed size-limited missiles. Another consideration is high maneuverability, which is a requirement for new air-to-air missiles to catch the new fighters. As a solution, most of new-generation air-to-air and surface-to-air missiles (Air Defence Systems) have lateral thruster attitude control sections. Also, guiding radar uncertainties and end-game maneuvers of targets decrease the hit probability. Supporting the maneuvers in the terminal phase by lateral thrusters can help increase the hit probability. In summary, a competitive small size and highly maneuverable missile will be designed, and modeled. The performance of the model will be tested with a shooter and target model. It is anticipated that this study will help realizing consistent, reliable and futuristic missile design.

Friday, May 31 • 15:00

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

About the Speaker

Hüdai Erpulat is working as a researcher in the Flight Mechanics Group at TÜBİTAK SAGE and currently pursuing an M.S. degree in aerospace engineering at AYBU. He received his B.S. degree in aerospace engineering from Gaziantep University (2020).