



### DESIGN PROJECT PROPOSAL FORM

<b>Academic Year</b>	<b>2022 -2023</b>	<b>Semester</b>	Fall <input type="checkbox"/> Spring <input checked="" type="checkbox"/>
<b>Project Type</b>	<b>Research</b> <input type="checkbox"/> ME 411 Thermal & Fluid Design <input type="checkbox"/> ME 413 Mechanical Design <input checked="" type="checkbox"/> ME 415 Robotics & Control Design	<b>Application</b> <input type="checkbox"/> ME 412 Thermal & Fluid Design <input type="checkbox"/> ME 414 Mechanical Design <input checked="" type="checkbox"/> ME 416 Robotics & Control Design	
<b>Advisor</b>	Asst.Prof.Dr.Çağlar UYULAN		
<b>Project Title</b>	Developing Machine Learning-based Recognition Algorithm through Data Acquisition from Eye Tracking Equipment		
<b>Purpose and Scope</b>	<p>The primary use of the eye-tracking devices will be in developing a “natural” computer authentication scheme, ultimately using only standard computer hardware. “Natural” authentication means transparent to the user: able to recognize the user while performing productive activities, without requiring any special authentication tasks. Ideally, instead of having to correctly enter a password, the user will be recognized gradually through natural interaction with the computer. This form of authentication will be based on a composite profile of the user, including biometric and behavioural traits. Using eye-tracking equipment, the co-PIs will research new schemes and ways to integrate already published authentication schemes. A second direction involves the development of assistive software for teaching lectures. Eye-tracking devices can be used to assess the habits of users as revealed by eye dynamics, as well as to determine the differences between novice and expert users. Eye dynamics are relevant in applications where the users must be trained to browse visually in a particular pattern.</p>		
<b>Work Packages</b>	<ul style="list-style-type: none"><li>• Data Acquisition and Labeling Process</li><li>• Feature Extraction</li><li>• Classification</li><li>• Real-time Tests of the Developed Algorithms</li></ul>		
<b># of Team Members</b>			
<b>This section to be filled by the Commission</b>	<p>The Project Proposal</p> <input type="checkbox"/> is approved. <input type="checkbox"/> should be revised considering the following suggestions:		



The projects are aimed to prepare students to attain the following program educational objectives:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Therefore, the final report of the project should contain the following:

- i. Definition of the design problem and its limitations
- ii. Theoretical information about the topic, standards and patents
- iii. Different design options and selection criteria
- iv. Optimal solution with appropriate selection criteria
- v. Cost accounting, feasibility, compliance with regulations and standards, environmental impacts, and compliance with ethical rules
- vi. Engineering drawing and presentation methods for presenting