GRADUATION PROJECTS

1.Team organization: Each team should be organized as a group of 3 or 4 people. Teams are directly responsible to provide progress to their project assistants. Each assistant is assigned to one of the instructors. Instructors will be the project coordinators.

2.Meetings: Meetingswill be done with the assistants on a regular basis. In these meetings, progress on the project will be reported to assistants and each team member will be graded individually in terms of his/her contribution. Grading will be based on a guideline whose details will be determined by the project coordinators. In addition to weekly meetings, monthly meetings will be done with the instructors.

3. Reports: The documents that should be prepared throughout the project development are listed below. These are the reports that should be prepared by all the groups. The general format and the outline of the reports will be announced by the project coordinators at the starting of the semester. However, depending on the project, project coordinators/assistants can request extra reports and demos.

- **Software/Hardware Requirements Specification:**The requirements document should give information about the general solution overview, including but not limited to the purpose of the product, important definitions, system overview, references, overall description of the product, product perspective, system interfaces, user interfaces, hardware interfaces, software interfaces, communication interfaces, memory constraints, functional requirements, external interface requirements, performance requirements and time planning. This document should be presented to the project coordinators at the first or second monthly meeting.
- **Software/Hardware Design Report:** The design document should include information about the detailed design considerations, detailed data description (possibly a data dictionary and an ER diagram for the database design), architectural design, details about the system components, user interface design, and a detailed design of the final product. This document should be presented to the project coordinators accompanied by a demo of the prototype of the product.
- **Monthly progress reports:** These reports are in the form of a 5-10 pages report including details about the progress performed in the previous month. Each student's individual contribution should be given in these reports and reports will be graded by the assistants and the project coordinators.
- **Final Term Project Report:** This will be the final report that will give the overall description of the project. This report will be prepared at the end of each semester. The outline of this report will be determined by the project coordinators and assistants and its format can vary depending on the project type and content. Students will be encouraged to write an academic paper that can be submitted to a related conference or workshop; therefore, if the project coordinator approves that the project can be reported as an academic paper, the final report will be prepared based on the guidelines of a selected conference or workshop.

4.Presentations: At the end of each term, students will present their projects and make a demonstration. The presentations will be made to the whole class. All the project coordinators and assistants will attend the presentations. Other department members related with the topics can also

attend to the presentations. At the end of the year, projects will be graded and they will be evaluated by a selected group of instructors and the best 3 projects will be given awards by the department.

5. Grading policies (tentative): Current grading policy, which is tentative, is given below.

- Regular meetings with assistants, (each student will be graded independently) 20%
- Monthly meetings, (each student will be graded independently) 20%
- Reports 25%
- Demo &Final Presentation 35%

6. Project topics: Teamsshould select one of the topics listed below. The selection should be approved by the project coordinators.

Project #	Project Title	Responsible Asistant	Responsible Project Coordinator	Related Topics
1	A nutrition and exercise recommender	Elif Gül	Öznur Alkan	Data Mining, Artificial Intelligence, Knowledge Engineering
2	Report Expert	Elif Gül	Rahime Belen Sağlam	Database Applications, Object Oriented Programming
3	Opinion Detector		Rahime Belen Sağlam	Opinion Mining, Text Mining
4	Disease Map		Rahime Belen Sağlam	Text Mining
5	Encoder/Decoder of Data Applicaton	Cavidan Yakupoğlu		
6	Crypt attack application	Cavidan Yakupoğlu	Baha Şen	Cryptography, computer networks
7	Efficient Intrusion Detection Systems	Cavidan Yakupoğlu	Hilal Kaya	Computer networks
8	Attacks implementation on SSL/TLS	Cavidan Yakupoğlu		Computer networks protocols
9	Developing new cryptographic hash algorithm	Cavidan Yakupoğlu		Cryptography
10	Travel logger	Erdem Özdemir	Shafqat Rehman	Software engineering, Multimedia applications, Social Networks
11	Large scale sentiment analysis engine	Erdem Özdemir	Öznur Alkan	Data mining, big data, software engineering, recommendation engines
12	Mobile phones rather than expensive car features	Erdem Özdemir		Computer vision, Machine learning, Driver Assistant Systems
13	Data Mining and Analysis on Twitter to Discover User Sentiment	Hatice Çataloluk	Öznur Alkan	Data Mining, Artificial Intelligence, Knowledge Engineering
14	Course and Exam Timetable Software using an Optimization Algorithm	Hatice Çataloluk	Öznur Alkan	Artificial Intelligence, Optimization
15	Implementation of an E-Commerce application with Data Mining	Hatice Çataloluk	Hilal Kaya	Data Mining, Web Programming

	methods			
16	A Real-Time System to Recognize Turkish Sign Language alphabet using Kinect	Hatice Çataloluk		Pattern Recognition, Computer Vision, Machine Learning
17	Biomedical Sound Recognition System	Ayşe Arslan	Hilal Kaya	Machine Learning, Signal Processing, maybe Parallel Programming
18	Biomedical Image Recognition System	Ayşe Arslan	Hilal Kaya	Machine Learning, Image Processing, maybe Parallel Programming
19	An indoor navigation app. for a shopping center in Ankara	Elif Gül	Shafqat Rehman/ Baha Şen	Mobile (Android) Programming, Data Mining, Sensor Programming , Localization Techniques
20	Furniture placement application	Elif Gül	Baha Şen	Augmented Reality, Mobile Programming, Image Processing

Project #	**Description**
1	Depending on the data collected from the people and the Web, a nutrition and exercise recommendation system will be developed. The system can use several demographic information about the people in addition to their daily programs and availabilities. The system can be collaborative, content based or hybrid depending on the availability of the data. The final product will be a user-friendly Web site or a desktop application that will work through user login. Therefore, user data will be recorded in a database.
2	The project will produce sophisticated ready-to-use reports by transforming raw data into meaningful and useful information. It will generate reports in predetermined formats but it will also allow end users to generate their own report formats by selecting attributes and dimensions. The goal is to allow easy interpretation of large volumes of data by reporting several information such as basic descriptive statistics.
3	The project will detect opinion polarity in blog comments and give statistics about the comments for each entry (number of positive comments, number of negative comments etc.). It will guide the authors by detecting the topics which get the most positive comments. Topic extraction and sentiment analysis will be carried out within the project.
4	A web-based application that processes data organized from social media and search engine trends about chronic diseases will be developed. The aim is to create a disease map for Turkey which can guide doctors about the potential enviromentalaffects on these diseases. The project will also keep historic data and check proportion of increase in talking or searching about diseases in social media or search engines.
5	Develop network application which provides DES encoding/decoding of data, transmitted via network. Implement the following operation mode of DES 1.1. Cipher Block Chaining (CBC) 1.2. Cipher Feedback (CFB) 1.3. Output Feedback (OFB) 1.4. Counter Your application should provide interaction of two peers via network (send and receive data, their encryption and decryption, display of plaintext and sent ciphertext on sending side; display of received ciphertext and obtained plaintext on the receiving side).
6	Implement application allowing to perform crypt attack: 2.1. Known plaintext-ciphertext attack for Hill cipher 2.2. Known ciphertext attack for mono alphabetic cipher 2.3. Known plaintext-ciphertext attack for Playfair cipher 2.4. Known ciphertext attack for poly alphabetic cipher Your application should ask from user all necessary for attack information, perform attack, and display

	results of attack.
7	Intrusion detection is the problem of identifying unauthorized use, misuse, and abuse of computer systems by both system insiders and external penetrators. Develop a new IDS for different scenerios.
8	Transport Layer Security (TLS) and its predecessor, Secure Sockets Layer (SSL), are cryptographic protocols designed to provide communications security over a computer network.Implement SSL/TLS attacks(popular ones or new attacks)
9	A cryptographic hash function is a hash function which is considered practically impossible to invert, that is, to recreate the input data from its hash value alone. There are lots of hash algorithms in use. Develop a new cryptographic hash function that satisfies following points: • Pre-image resistance • Second pre-image resistance Collision resistance
10	Travellers is an mobile app for storing paths travellers took, pictures they took and activities they performed. By the help of traveller logger, users will be able to share fantastic videos of their daily activities on social media or keep those videos as memory. Details: Mobile phones will automatically collect gps locations & pictures taken by mobile phone etc and will create a path on map with pictures of what places traveller visited or what they did. In the end, using those logs and pictures a video will be generated with different designs depending on user's choice.
11	This application will crawl online resources on web and collect data to analyse reviews about the products. It will then do extensive analysis to find out negative and positive reviews with good quality. It will then provide a user interface for people to search for products they are interested and get all positive and negative reviews of the product. Details: Search service should be creating an index file to facilitate search and various machine learning algorithms should be used for best service for the users.
12	Nowadays, car manufacturers sell security package such as traffic sign detection, lane detection, pedestrian detection features for thousands of euros. In this project, you will come up with a simple mobile application that will do automatically using mobile phone camera and itscpu! With this mobile app, everyone who place their camera on front of their car will have a security package in their car for a very low price rather than paying thousands of euros to car manufacturers. You can also add other set of features such as location of traffic controls, detection of traffic jam and route planner to this cool package.
13	A sentiment analysis model for twitter users will be developed by using data mining algorithms. The sentiment analysis model is used to analyze a tweet and classify it with one of the labels that you provide; for example, you could analyze a tweet to deter mine whether it is happy, frustrated, or sad. Data collection is necessary to train the sentiment analysis model against examples of the type of data that you are going to see when you use your model.Once you have collected your training samples, you will need to pre-classify each sample with a label for the model training.
14	The aim of this project work is develop course and exam timetabling software that will be useful to our faculty, using artificial intelligence and optimization algorithms. The main challenge is to schedule courses and exams to timeslots and rooms over a specific period while satisfying a set of constraints.
15	An ASP.NET web application for e-commerce will be developed. Then a data mining model will be developed that uses association rules algorithms to identify patterns of product models which are commonly purchased together. The data mining model will enhance the existing web application to provide relevant purchasing suggestions to online customers.
16	A software to recognize Turkish Sign Language alphabet will be developed using the data provided by the Microsoft Kinect XBOX. A machine learning algorithm will be used for the project. The system must work on real-time.
17	Abnormal biomedical sounds may be a precursor of many serious diseases. Listening process can be supported by using computer aided automatic diagnosis systems for fast and accurate diagnosis. These systems are useful to remote diagnosis systems in place that have the lack of physicians and modern techniques. In this study, recorded biomedical sound data sets that may be found from web sources or can be recorded through an hospital can be classified by using machine learning algorithms. At the end of this study, different diseases will be detected just listening sounds by an automatic

	system instead of a doctor.
18	In this study, biomedical image data sets (tomography, mammography etc.) that may be found from web sources or can be recorded through an hospital can be classified by using machine learning algorithms. At the end of this study, different diseases will be detected just processing of these images by an automatic system instead of a doctor.
19	The aim of this application is that the store wanted to go easily can be found when a user is at a mall. The application should show the directions and describe stores' floor and place depending on users' location and malls' indoor maps. Moreover, If the system supports sound-based commands and alerts, it will be very useful for blind people. The final product will be a user-friendly mobile application that will work through user login. If It collects users' searches and top stores, it can recommend the top stores' sales to the user. So, user data will be recorded in a database.
20	The aim of this application is a preview of how desired furniture is placed in the photograph of a room. In this project, Augmented reality, image processing and database techniques must be used.