Learn STEM

*Innovative Model
of learning STEM
in secondary schools*

School Education
ERASMUS+

KA220-SCH -
Cooperation partnerships in
school education

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LearnSTEM

Practices
in Teaching STEM Through Innovative
Pedagogical Approaches for Türkiye

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KIRŞEHİR/TÜRKİYE

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Co-funded by
the European Union

The importance of STEM in Educational contexts

- STEM education has been accepted as an interdisciplinary approach covering the entire educational process from pre-school to higher education.

- STEM education is an education that supports mental process development, entrepreneurship and product development skills.

- TÜBİTAK's (Scientific and Technological Research Council of Turkey) 2011-2016 Science and Technology Development Plan includes some activities that support STEM education of students (Baran, Canbazoğlu-Bilici, & Mesutoğlu, 2015). According to this strategy, it is desired to support science education with science fairs at primary and secondary school level, and activities to be held in the fields of space sciences, mathematics, science and technology for young people.

- In order to reveal successful students and teachers in STEM education, TÜBİTAK conducts project studies and organizes competitions. In addition, regarding STEM education in our country, science centers have started to be opened in various provinces by TUBITAK.

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The importance of STEM in Educational contexts

- Science Centers aim to eliminate prejudices against science in society by making students love science and scientists. In the science centers established for this purpose, STEM activities are held with students during extracurricular times (STEM Academy, 2013).

- Since 2014, the General Directorate of Innovation and Educational Technologies has been included as a national support point in the Scientix Project conducted by the European Schoolnet on STEM education.

I Meet Engineering

Project Date

June 2018

Organization

TÜBİTAK

Project Coordinator

Yusuf Demir SAC

Age Range

Students from 12 till 14 years old

Subject/Discipline or crossdisciplinary

Science, Technology, Engineering and Mathematics

Aim of The Project

The aim of the project was to create an opportunity for successful students in rural areas, to introduce them to engineering education at a young age and to attract their interest and attention to the professions in these fields.

Brief Description of The Project

Due to the need for qualified workforce in the fields of Science, Technology, Engineering and Mathematics (STEM), STEM education approach from pre-school to university has come to the fore in recent years. Integration of engineering with the education process increases the demand for professions in these fields.

With the activities of the project, students were provided to understand the engineering design process. The students met with agricultural engineering by practicing in the field or garden environment, stepped into computer, software and electrical-electronic engineering with robotic applications, met with chemical engineering by making soap and natural markers, understood the basics of mechanical and civil engineering with STEM activities and had the opportunity to design with a 3D printer.

Humanoid Robotic Arm

Project Date

March 2019

Organization

TÜBİTAK

Project Coordinator

Yusuf Demir SAC

Age Range

Students from 12 till 14 years old

Subject/Discipline or Crossdisciplinary

Mathematics, Physics, Software

Aim of The Project

The aim of the project is to design a humanoid robot arm and control this robot arm with the movement of a human.

Humanoid Robotic Arm

- In the project, it was examined in which axes and angles a human arm has the ability to move.

- Afterwards, previous robotic arm studies were examined.

- A robotic arm design was drafted, similar to the mobility of a human arm.

- Based on the draft prepared for the robotic arm design, the materials to be used in the project were determined.

- Tinkercad program was used for 3D drawings. The parts drawn in Tinkercad were printed out on the 3D printer.

- Servo motors and connections of the printed parts with each other were made. Finally, the necessary codes were written on the Arduino.

- The robotic arm can do the opening and closing movements of a human with the same arm movement.
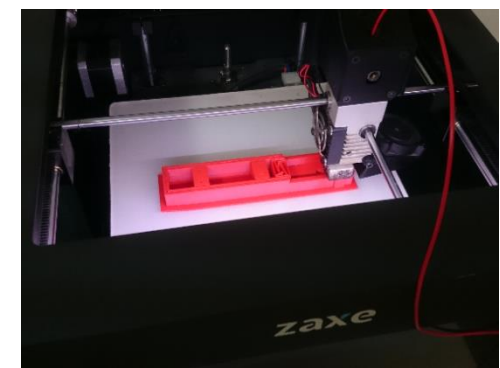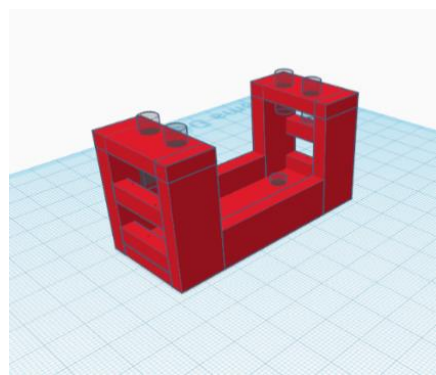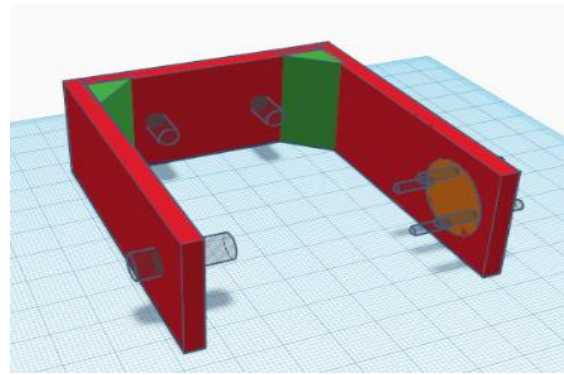
Predicting Traffic Density with Machine Learning

Project Date

March 2022

Organization

TÜBİTAK

Project Coordinator

Yusuf Demir SAC

Age Range

Students from 12 till 14 years old

Subject/Discipline or crossdisciplinary

Maths, Software

Aim of The Project

The aim of the project is to predict the traffic density with the Naive Bayes algorithm, which is a machine learning method.

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Predicting Traffic Density with Machine Learning

- In order to determine the factors affecting traffic density and flow, previous studies on this subject were examined.

- In this study, weather conditions, weekday-weekend status, and time of day were used as factors. These factors express the characteristics in the research model.

- The traffic density, which is tried to be predicted as a result of the research, expresses the class variable.

- In the research, Bebek-Arnavutköy Street in Istanbul has been determined as the way of application.

Predicting Traffic Density with Machine Learning

- The data of the study were collected by 3 researchers for about 2 months, paying attention to the fact that there are different times of the day and different weather conditions on weekdays and weekends.

- The researchers then wrote the codes based on the Naive Bayes algorithm.

- With the written program, when the weather, weekdays/weekends and the time interval of the day are entered, the probability percentage of the traffic density and non-busy situation is calculated.

- As a result, it is seen that the program we developed based on the Naive Bayes algorithm has a 78% accuracy rate in predicting traffic density.

Young Intelligences on the Path to Mathematics

Project Date   May 2009

Organization   National Agengy Youth for Europe Sub-Action 1.2 – Youth Initiatives

Project Coordinator Yusuf Demir SAC

Age Range Students from 13 till 15 years old

Subject/Discipline or crossdisciplinary Maths

Co-funded by the European Union

Young Intelligences on the Path to Mathematics

The main purpose of the project is to ensure the socialization of students and to reach students at schools with low socio-economic level. In this direction, it is aimed for students to socialize, communicate, be tolerant towards society, participate in social activities, strengthen their creativity and entrepreneurship by sharing the mathematical materials they have prepared with their peers.

Co-funded by the European Union

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