

International Brokerage Event
Brussels, 26-27/10/2017



Istanbul University
Engineering Faculty
Electrical & Electronics Engineering



Asst. Prof. Hasan TIRYAKI
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Description of the Organization



Istanbul University, the most renowned institution of higher education in Turkey, has, throughout its history, been a pioneer to science, contemporary values and enlightenment of the society. Istanbul University is among the first ten universities established in Europe and now ranks among top 500 in the world.

In terms of EU Project; started on 01.06.2017, our project team is currently working on an EU Project named "**Cities -4- People**" under the subject of "People Oriented Transport and Mobility" with the grant agreement number of **723194** (With the project budget of; **3,999,937.50 €**).

In addition, our TUBITAK ARDEB 1003 project titled "**Improvement of Fuel Efficiency and Innovative Technologies for Internal Combustion Engine Vehicles**" under project number of **216M252** accepted & passed. This project aims to develop a hybrid drive technology that can be used in vehicles to increase fuel efficiency and thus reduce carbon dioxide emission. Combined with an internal combustion engine, BLDC engine and thermoelectric generator (TEG) technology, this system aims to reduce fuel consumption by 15%. The project involves the usage of an internal combustion engine, a brushless DC electric motor and a thermoelectric generator together and an electronic control unit design for this system. Boron material and domestic production magnets usage in the design of the electric motor and production of the thermoelectric modules from nanocomposite materials are the core milestones in this project.

Asst. Prof. Hasan TIRYAKI is director of Designing and Developing Electrical and Electronics parts while **Assoc. Prof. Sedat BALLIKAYA** is director of Construction and Designing of Thermoelectric Generator parts of this project.

Description of the Organization



Asst. Prof. Hasan Tiryaki (Team Leader for Electronics)

- Doctorate in Electrical and Electronics Engineering at Istanbul University, between 2009-2013.

Experts on

- Energy Control for Battery Systems
- Construction and design of electrical motor for hybrid and electrical vehicles
- Energy and Battery Control Systems for Hybrid Energy System (Thermovoltaic, solarthermal energy, thermoelectric power generator)
- Electrical Engineering in relation to Railway Systems
- Control Systems & Power Plants
- Electric Vehicles

- Undergraduate and Graduate level courses.
- MilAT 1453 Electric Vehicle Research & Development Society Academic Advisor.

Research Projects Achieved or On going

International

- European Commission Horizon 2020 "Mobility for Growth" call, "Cities for People (Cities -4- People)" EU project with the Grant Agreement number of 723194, Project Director, (2017-...).

National

- TUBITAK ARDEB 1003, 216M252, "Improvement of Fuel Efficiency and Innovative Technologies for Internal Combustion Engine Vehicles, Project Director, (2017-...).
- *Manager and Researcher of 30 Project (26 Projects completed) regarding to electrical & electronics engineering funded by Istanbul University and others between 2002-2017.*

Description of the Organization



Master's Degree Student Alper Gün

- Master's degree student, Electrical & Electronics Engineering-Istanbul University, 2016-present.
- He is the project manager & researcher of Cities -4- People Project for Istanbul University.
- MilAT 1453 Unmanned Air Vehicles (Fixed Wing UAV & Rotary Wing UAV) Team Advisor.
- Expertise in: Robotics, Control technique application, renewable energy sources, electrical railway systems, digital control, and energy systems control.
- Research Areas: Robotics, Autonomous Vehicles, Electric Vehicles.

Description of the Organization



Assoc. Prof. Sedat BALLIKAYA (Team Leader for Thermoelectrics)

- Doctorate in Physics at Istanbul University Faculty of Science, between 2006-2010.
- Post-Doctorate in Physics at University of Michigan, between 2010-2017. (for different periods)

Experts on

- Developing high efficient thermoelectric material for energy harvesting, smart circuits
- Construction and design of electronic heat transport measurement systems
- Design and Construction of Hybrid Energy System (Thermovoltaic, solarthermal energy, thermoelectric power generator)

Research Projects Achieved or On going

International

Research Scientist in Project (ECP-FP7) High Efficient Nano Composite Thermoelectric Materials for Energy Harvesting, funded project AGRISENSACT, KTH Royal Inst. of Tech. Sweden, 2014-2017 Completed-

Research Scientist in Project (DE-SC0000957) Solar Energy Conversion in Complex Materials (SECCM)-Univ. of Michigan-USA 2010-2015 Completed

National

Manager in Project (216M254) Developing TEG generator for waste heat recovery for car exhaust, 2017-2020, funded by TÜBİTAK On going

Manager in Project (115F510) Synthesizing and Characterization of High Efficient Thermoelectric Materials 2016-2018, funded by TÜBİTAK On going

Manager of 13 Project (10 Projects completed) regarding to developing new efficient Thermoelectric Materials funded by Istanbul University between 2010-2017

Description of our research interest

We are mainly focusing on Electric Vehicles and Unmanned Aerial Vehicles; design & development. We can design & develop every component of an electric vehicle & unmanned aerial vehicle. We are currently deeply interested in designing fully-autonomous electric vehicle prototype.

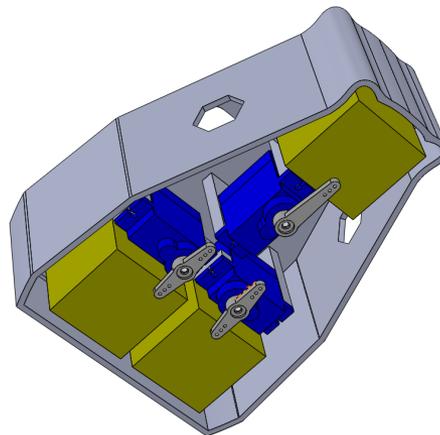
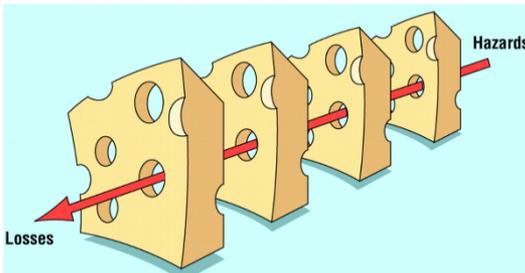
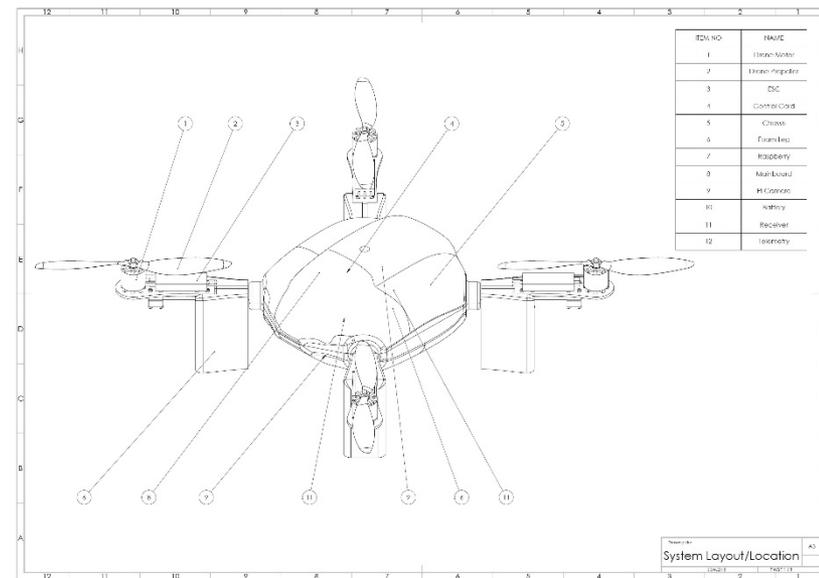
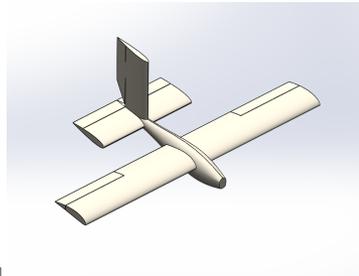
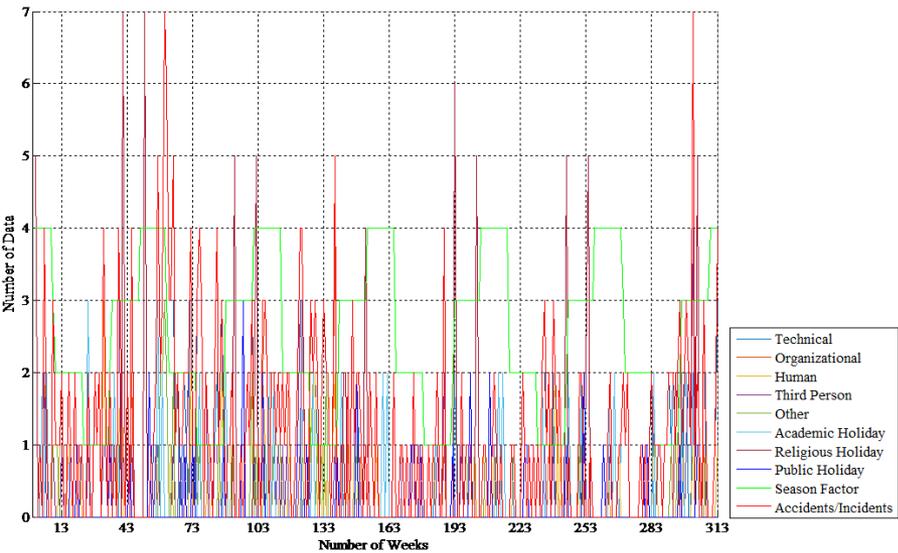
Our research team have also long term experience on thermoelectric technology (developing high efficient thermoelectric materials, modules and systems), hybrid systems for energy harvesting and energy battery control systems.



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R&D Facilities

Human Factors in Accidents & Incidents on Railway, Safety Management System, Fixed & Rotary Wing UAV Design & Development



Relevant 2017 Call Topics to our Research Areas...



We are interested in “**Workshop 3: Transport. Mobility for Growth, Automated Road Transport and Green Vehicles**”;

MOBILITY FOR GROWTH

- Human Factors in Transport Safety
- Safety in an evolving road mobility environment

AUTOMATED ROAD TRANSPORT

- Testing, validation and certification procedures for highly automated driving functions under various traffic scenarios based on pilot test data
- Support for networking activities and impact assessment for road automation
- Human centred design for the new driver role in highly automated vehicles
- Developing and testing shared, connected and cooperative automated vehicle fleets in urban areas for the mobility of all

GREEN VEHICLES

- Integrated, brand-independent architectures, components and systems for next generation electrified vehicles optimised for the infrastructure
- Virtual product development and production of all types of electrified vehicles and components
- User centric charging infrastructure

Relevant 2017 Call Topics to our Research Areas...



We are also interested in “ **Workshop 4: Smart Energy Systems and Consumers**”;

- Consumer engagement and demand response
- Flexibility and retail market options for the distribution grid
- Solutions for increased regional cross-border cooperation in the transmission grid
- Integrated local energy systems (Energy islands)
- Decarbonising energy systems of geographical Islands
- TSO – DSO – Consumer: Large-scale demonstrations of innovative grid services through demand response, storage and small-scale (RES) generation
- Research on advanced tools and technological development

After negotiating & discussing potential project subjects/areas with our potential partners, we think we will be able to determine a title for our potential project idea.

H2020 projects ...



We are interested in following H2020 Project topics;

- MG-2-1-2018: Human Factors in Transport Safety
- DT-ART-01-2018: Testing, validation and certification procedures for highly automated driving functions under various traffic scenarios based on pilot test data
- DT-ART-03-2019: Human centred design for the new driver role in highly automated vehicles
- DT-ART-04-2019: Developing and testing shared, connected and cooperative automated vehicle fleets in urban areas for the mobility of all
- DT-ART-05-2020: Efficient and safe connected and automated heavy-duty vehicles in real logistics operations
- DT-ART-06-2020: Large-scale, cross-border demonstration of highly automated driving functions for passenger cars
- LC-GV-01-2018: Integrated, brand-independent architectures, components and systems for next generation electrified vehicles optimised for the infrastructure
- LC-GV-02-2018: Virtual product development and production of all types of electrified vehicles and components
- LC-GV-03-2019: User centric charging infrastructure
- LC-GV-06-2020: Next generation and realisation of battery packs for BEV and HEV
- LC-GV-09-2020: Next generation electrified vehicles for urban use

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