

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



***Istanbul University  
Engineering Faculty***



***Electrical & Electronics Engineering***

***Asst. Prof. Dr. Hasan TIRYAKI***  
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***Assoc. Prof. Dr. Sedat BALLIKAYA***  
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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. The foundation of Istanbul University dates back to the conquest of the city by Sultan Mehmet II in 1453. 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



## Assoc. Prof. Dr. 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 (Thermovoltaik, solarthermal energy, thermoelectric power generator )

### Research Projects Achieved or On going

#### International

*Research Scientist in Project (ECP-FP7) High Efficient Nano Kompozit 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 the Organization



## Master's Degree Student Ümit ÖZGÜN

- Master's degree student, Electrical & Electronics Engineering-Istanbul University, 2017-present.
- He is the research fellowship of 216M254 "*Synthesizing Developing TEG generator for waste heat recovery for car exhaust*" TUBITAK ARDEB 1003 Project.
- Expertise in: Designing and Testing Thermoelectric Modules.
- Research Areas: Thermoelectric Devices, Electronics for Hybrid Systems.

# Description of the Organization



## Master's Degree Student Oğuz GENÇ

- Master's degree student, Electrical & Electronics Engineering-Istanbul University, 2017-present.
- He is the research fellowship of 115F510 "*Synthesizing and Characterization of High Efficient Thermoelectric Materials*"TUBITAK ARDEB 1001 Project.
- Expertise in: Electronic PCB Design and Development
- Research Areas: Thermoelectric Devices, Electronics for Hybrid Systems.

# 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.
- 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-...).
- 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 our research interest



Our research and development team “MilAT 1453”, mainly works on Electric Vehicle and Unmanned Aerial Vehicle 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, or a design that can be used even for public usage with a mass production potential.

We also have long term experience 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 such as thermovoltaic, solarthermal energy, thermoelectric power generator.

We are kindly welcoming all potential project suggestions as we can provide any technical support upon the subject of ‘Workshop 1, 3 and 4.

We can&will provide a full-detailed report which will include all of our expertise upon request.



# Please add relevant 2017 CALL TOPIC ....

## Please add TITLE of the PROJECT IDEA ....



We are interested in “Workshop 1: Smart, Sustainable and Resilient Cities and Energy Efficient Buildings”;

- New developments in plus energy houses
- Integrated storage systems for residential buildings
- ICT enabled, sustainable and affordable residential building construction, design to end of life

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.

# Please add relevant 2017 CALL TOPIC ....

## Please add TITLE of the PROJECT IDEA ....



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

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.

You may take a look to our R&D team’s report, so that you may have deeper vision of what we are capable of.



Istanbul University  
Faculty of Engineering  
Electrical & Electronics Engineering  
Turkey



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