
ÖZYEĞİN
UNIVERSITY

TECHNOLOGY
TRANSFER
OFFICE

ÖZYEĞİN UNIVERSITY

NATIONAL INTERNATIONAL GRANTS CATALOG 2015

Contents

Preface

Director's Message

We are proud of publishing the new edition of "Grants Catalog" of Özyeğin University (ÖzÜ). The former catalogues provided a summary of the national and international grants carried out by ÖzÜ faculty members between 2009-2013 and in 2014, successively. This new edition presents national and international grant projects carried out and/or have been accepted for funding, but their grant agreements are still in the process throughout the year 2015. The catalog does not include awards received by our faculty members and academy-industry collaboration projects.

As in previous years, the main funding agency for the national grants is the Scientific, Technological Research Council of Turkey (TÜBİTAK) in 2015. In addition to TÜBİTAK 1001 and 3501 Programs, two new TÜBİTAK 1003 projects and a TÜBİTAK 1007 Project clearly demonstrate that 2015 was a good year for collaboration between academia, industry, and public sector at ÖzÜ. Additionally, Istanbul Development Agency (İSTKA) keeps its importance as the major funding agency for large-scale infrastructure projects. In 2015, ÖzÜ faculty members awarded four new İSTKA Grants.

For international grants, a great deal of funding mainly comes from EU Programs such as EC Life Long Learning, Horizon2020 and Erasmus+. In 2015, we won our second Horizon2020 Grant for a project called "Plotina". The "Plotina"Project is the first ever cooperation framework project in Social Sciences at ÖzÜ.

This catalog briefly demonstrates that during 2015, the university improved its overall performance in large-scale projects and increased the number of grants with high budgets such as TÜBİTAK supported 1003 and 1007, and İSTKA Programs.

We hope that this catalog aligns perfectly well with our mission. We are pleased to offer our congratulations to all of our faculty members who have contributed to develop our research grants portfolio and this catalog.

Please note that the catalog will be also available online at ÖzÜ TTO web site (http://tto.ozyegin.edu.tr).

Sincerely,
Nilay Papila
TTO Director

NATIONAL GRANTS 2015

Analysis of the Determinants of Declining Home Ownership Rate in Turkey

Abstract

This project will be the initial attempt to investigate the determinants of the declining homeownership ratio by using the macroeconomic, financial and socio-demographic data in Turkey. The ultimate goal of the present research is to explain the reasons for declining home ownership rate in Turkey over the decade through the usage of micro-scale, household budget survey data produced and published by Turkish Statistical Institute. More specifically, the determinants of duration of residence in a particular tenure status will be examined by taking into account the physical characteristics of housing units, the financial and socio-demographic characteristics of the head of households, and macroeconomic and financial data including the house prices and rent. The second aim of the project is to calculate the capitalization rates (cap rates) of different housing unit types in urban areas of Turkey through the usage of TUIK 2012 household cape. This project aims to investigate which physical characteristics of housing dwellings significantly affect the capitalization rate of Turkish housing market. It is believed that the results of this research will contribute to international academic literature and rapidly growing housing sector investors in Turkey.

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Department:
Banking and Finance

Funding Scheme: TÜBİTAK 1001
Start Date: April 15, 2015
Duration: 12 Months
Budget: 54,750 TL

TÜBİTAK

Utilization and Effectiveness of a Cell Separation Technology (LeukoChip) for Easier Radionuclide Labeling of Leukocytes

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Electrical & Electronics Engineering

Funding Scheme: TÜBİTAK 1001
Start Date: TBA
Duration: 24 Months
Budget: 594,000 TL

TÜBİTAK

Abstract

The aim of this project is to adapt, develop, and employ a technology called LeukoChip for infection imaging, which in previous studies have been successfully used for effective removal of red blood cells for other applications. To increase the in-vivo success of leukocyte imaging, leukocyte separation with LeukoChip will be optimized to retain complete cellular activity. The design and operational parameters of the presented microfluidic technology will be improved; blood separation volume capacity and throughput will be increased while the viability and chemotaxis capacities of the cells will be preserved. These parameters will be measured in comparison with standard leukocyte separation methods. Following the completion of in-vivo verification, leukocytes purified by LeukoChip will be used in in-vivo for diagnosis of infections in patients. The outcomes of this project will lead to faster diagnosis of infections, and will enable the application of labeled-leukocyte scintigraphy in previous unfeasible patient groups (e.g. pediatric).

Analysis of Pharmaceutical Sector as an Effective Industry and Health Policy Tool

Abstract

With the increasing pace of globalization and the transition to knowledge economy in the 21st Century, a sustainable economic growth policy should focus on preserving and promotion human capital as well as creating a high value added industry. This argument further necessitates an effective health and industry policy design, which places accumulation of human capital and R&D intensive sectors at its core. This project takes this argument as its starting point and analyzes the pharmaceutical sector, which is located at the intersection of health and industry policy, from the perspective of Turkish Economy. In the first of the project, the strategic importance of the pharmaceutical sector for a competitive, high-value added industrial policy is investigated. The second part of the project measures the impact of per capita pharmaceutical consumption and expenditures on various health indicators. The third part of the project focuses on the global budget and international reference pricing mechanism, which has been used as the main driving policy tool by the government to control pharmaceutical consumption and expenditures.

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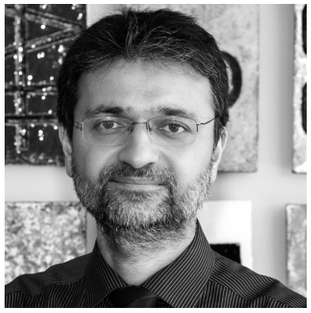
Department:
Economics

Funding Scheme: TÜBİTAK 1001
Start Date: April 15, 2015
Duration: 24 Months
Budget: 144,000 TL

TÜBİTAK

Gyroscopes Based on Acoustic Waveguides



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Funding Scheme: TÜBİTAK 1001
Start Date: June 1, 2015
Duration: 36 Months
Budget: 558,148 TL

TÜBİTAK

Abstract

This project proposes a novel gyroscope that uses effect of Coriolis force on the velocity of acoustic waves propagating in a waveguide. The ultimate goal of the project is to gain understanding of how to design gyroscope that is more stable than MEMS gyroscopes and has a potential to reach the stability of optical gyroscopes, and to demonstrate the operation of the prototype in the laboratory. The aim of this project is to discover the design method of a gyro that will not only have the potential to reach the stability of the fiber optic gyroscopes but also compete with MEMS-based gyro in respect to size and power consumption. The main reason of using acoustic wave is that these waves have much slower speed compared to speed of light. A gyro can be made by using much smaller waveguides than optical fibers, because speed of the acoustic wave is one million times smaller than the speed of the light. Besides piezoelectric transducers consume much less power than laser diodes do. Therefore, one can built more power efficient gyros using acoustic waves. The structure of gyroscope proposed in this project is highly novel. The first outputs of this project will be as publications and patents. In the next step, prototype of the proposed device will be fabricated in a laboratory. If the required stability values are obtained, it is possible to produce a gyroscope that can compete with fiber optic gyroscopes. In addition, if it is proved that gyro with high stability can be performed with this method, this will open the way for gyroscopes using a closed waveguide that can be built on a silicon substrate. Gyroscopes which are very small and low power can be made by this wave guide integrating with electronics. Another objective of this project is to educate more researchers working on inertial sensors. In general, number of academicians and engineers who work on the development of inertial sensors in academia and in industry is very little in Turkey. The successful completion of this project will contribute to the country in this regard as well.

An Integrated Solution Approach for Inventory Routing Problem and Its Applications

Abstract

Inventory Routing Problem (IRP) can be defined as determining the replenishment time, quantity and delivery routes for a set of customers using a single product supplied by a central depot over a planning horizon. IRP has emerged while investigating the vendor-managed inventory models instead of classical inventory models where customers determine the order time and quantity. These models offer several advantages both to the vendor and the customers. These include effective capacity planning by determining the delivery quantities, reduced transportation costs by coordinating the timing of deliveries to different customers and reducing the bullwhip effect by taking the customer usage rates into account. Because of these advantages, IRP has been implemented in different areas including the planning of distribution of beverages, industrial gases and automotive spare parts. In order to take advantage of vendor-managed inventory models, IRP has to be solved effectively. Although IRP has similarities with Vehicle Routing Problem (VRP), it is much more complex than VRP. The main difference between VRP and IRP is the fact that in IRP the replenishment quantity for each customer is determined while taking the vehicle capacity, customer usage rates and customer storage capacities into account. This difference significantly increases the number of feasible solutions to the IRP and makes it difficult to solve optimally. Moreover, different from VRP, IRP is a multi-period problem. Hence, in IRP depending on the vehicle and customer storage capacities, customers can be served by different routes in different periods and delivered different quantities each time. Finally, in some variants of IRP inventory holding costs incurred by the vendor and/or the customers have to be considered while forming the delivery plans and determining the delivery quantities. Because of several options in routing and related inventory planning problem in a multi-period setting, IRP is one of the most difficult routing/inventory problems in the literature. The main goal of this project is to develop computationally effective, practical and versatile solution methods that can handle these two stages (determining the delivery quantity to each customer and designing the delivery routes) in an integrated manner. In addition, in this project a novel clustering method, which has been demonstrated to perform well in a preliminary study is going to be used to form customer clusters.

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Industrial Engineering

Funding Scheme: TÜBİTAK 1001
Start Date: September 1, 2015
Duration: 36 Months
Budget: 336,750 TL

TÜBİTAK

Measuring the Relationship Between Spatial Configuration and User Behavior: User-Oriented Approaches to Urban Square Design Process at the Peripheral Municipalities of Istanbul

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Interior Architecture
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Funding Scheme: TÜBİTAK 1001
Start Date: September 15, 2015
Duration: 36 Months
Budget: 542,522 TL

TÜBİTAK

Abstract

This study focuses on "urban squares" designed at the peripheral districts of Istanbul, which act as subcentres simultaneously, to identify the relationship between spatial configuration and user behavior. As such, the association between design outputs, the spatial configuration of the urban square, and the patterns of occupation will be investigated. A second purpose is to examine quantitatively and qualitatively the mutual interaction between environmental perception and objective spatial configuration of the built environment. Findings of this study will offer a framework for developing design rules and policies in creating user-oriented urban environments. The proposed project is intended to address the above-described shortcomings. This study will analyze simultaneously objective (existing physical data/field observations) and perceived (questionnaires) environmental attributes to identify their relative impact on space use. Selected areas will be measured at the scale of the global urban context using detailed, micro-level units of analysis. Statistical models and behavioral mapping will be developed to determine objective and perceived environmental factors associated with patterns of space use. This has implications for methodology (Are both self-report and objective measurements required in the evaluation of public open spaces?) and design (To what extent do the differences among socio-cultural understandings of public open space impact space use and space design?). Within this scope, four urban squares located at the peripheral Municipalities of İstanbul's European part are selected as the study sample. These areas –Küçükçekmece Urban Square, Avcılar Urban Square and Street Redevelopment, Büyükçekmece Urban Square, and Beylikdüzü Urban Square– were selected due to the fact that they are located in districts that have grown towards the periphery between 1980 and 2000 paralell to E-5 highway and that have dominated the macroform of the city. After 2000 these districts have retained their peripheral characteristics yet at the same time served as sub-centres for the surrounding regions.

Modeling and Analysis of Radio Frequency Energy Harvesting and Transmitting Cognitive Sensor Networks with Markov Chains

Abstract

With the recent developments, ubiquitous sensor networks that are embedded in the environment and communicating with our mobile devices and the cloud, are expected to make the previously not sensed information available, offer us a truly interactive and immersive experience, and have great impact on fields such as health, energy, environment, etc. However these trends lead to the increase of total energy usage in such networks, which heightened the importance of the use of green technologies. Especially with the recent developments in VLSI technology leading to a reduced total energy need, makes the harvesting of ambient electromagnetic waves for energy a viable option for sensor nodes. This is called RF Harvesting in the literature. Enabling the perpetual operation of sensor nodes without the need for changing batteries, RF harvesting is advantageous as it is possible to find RF energy anywhere. Moreover, when the ambient RF energy is not enough, it is also possible to supply extra energy to the nodes via RF energy transfer from a node that is connected to a steady power supply. Another scarce source in wireless technology is the spectrum. Recently, cognitive radio technology has emerged as a method to use the spectrum in a more efficient manner. The unlicensed spectrum is expected to soon become not enough for the sensor networks that are the subject of this project. It might not be economically feasible to assign a dedicated spectrum to such applications. Thus, for especially delay tolerant applications, use of cognitive radio technology can be the solution to the spectrum shortage in sensor networks. In this project, RF energy harvesting and transmitting sensor networks will be analyzed, where each node is tolerant to delays and requires little processing power and throughput, but the sum data amount and total energy requirement is high.

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Electrical & Electronics Engineering

Funding Scheme: TÜBİTAK 3501
Start Date: April 15, 2015
Duration: 30 Months
Budget: 254,047 TL

TÜBİTAK

Improving Mother-Child Attachment Relationship with Circle of Security Parenting Training Program

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Psychology

Funding Scheme: TÜBİTAK 3501
Start Date: July 1, 2015
Duration: 36 Months
Budget: 349,762 TL

TÜBİTAK

Abstract

Attachment refers to the security based relationship that child forms with individuals around him/her, mainly with primary caregiver. The primary goal of the project is to explore the risk factors that affect mother-child attachment during early childhood and to test the short and long term effectiveness of Circle of Security Parenting Program (COSP-P). The project consists of two parts, a pilot study and a main study. In the plot study, psychometric properties of four questionnaires (Parental Reflective Functioning Questionnaires, Infant Intentionality Questionnaires, Coping with Toddler Negative Emotion Scale, Caregiving Helplessness Questionnaire) will be examined in our country for the first time. To conduct the pilot study, 250 mothers, whose children are in early childhood, will be recruited. In the main study, the risk factors related to mother-child early attachment relationship (perceived social support, psychological problems, and maternal stress), short and long term effectiveness of short version of COP-P Training Program will be examined. There will be 150 mothers with children aged between 12-36 Months in the study. The project will both have scientific and application-focused contributions. For the first time, the individual difference in mother-child attachment relationship for the 12-36 months will be explored and the risk factors associated with insecure attachment will be determined. In addition, psychometric properties of four scales on parents' emotional states, cognitions and coping skills will be adapted to Turkish. To establish new collaborations, the results will be shared with parents, those who are interested in child development, mental health professionals, and non-governmental organizations via Özyeğin University Relationship Research Laboratory's website and social media.

Adolescents' Disclosure to Their Parents: Individual and Familial Predictors and Positive Development

Abstract

This project aims to examine the individual and familial factors that may influence adolescents' disclosure and secrecy in their relationship with their parents and the consequences of such disclosure and secrecy. The study is framed from the perspectives of self-determination and stage-environment fit theories. According to self-determination theory, human beings have three basic psychological needs: autonomy, relatedness and competence. For optimal development, at all ages, especially during adolescence where the young experiences significant and rapid changes in physical, cognitive and social domains, it is crucial that these fundamental needs are met. Stage-environment fit theory builds upon self-determination theory and claims that when there is a misfit between the needs of the young and the opportunities the social environment provides for the young to meet these needs, such misfit leads to undesirable psychological outcomes. Adopting these two theoretical approaches, the present study aims to examine a) the links between the extent these three psychological needs are met in adolescent's relationships with both his/her mother and father and disclosure and secrecy behaviors, b) the links between disclosure and secrecy and positive development indexes such as life satisfaction, conflict resolution with father and mother, trait anxiety, and problem solving confidence. Another aim of the study is to examine the relationship between these variables by taking the ethical worldview of the adolescent into account. The three ethics perspective claims that people have different worldviews, which can be, categorized under three ethical orientations: ethics of autonomy, ethics of community and the ethics of divinity. These ethical worldviews function as regulating factors in moral reasoning as well as in all aspects of social relationships. The aim here is to investigate the moderating role of ethical worldviews of adolescents in the relationships between the variables examined in this study. Overall, it is expected that the findings of the present study will yield a pattern about the dynamics of adolescent disclosure and secrecy in the context of adolescent-parent relationships. An application-oriented goal of this project is to disseminate the findings and their implications to parents and professionals who are working with adolescents with an aim to contribute to the facilitation of positive youth development.

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Funding Scheme: TÜBİTAK 3501
Start Date: November 15, 2015
Duration: 36 Months
Budget: 144,982 TL

TÜBİTAK

Inventory Management and Transshipment Policies for Drug with No Annual Contract in Pharmaceutical Supply Chain Planning Under Uncertainty

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Funding Scheme: TÜBİTAK 3501
Start Date: September 1, 2015
Duration: 36 Months
Budget: 281,700 TL

TÜBİTAK

Abstract

This study analyzes several methods to provide a solution for the stock-out problem, which arises when prescription drugs are purchased without an annual agreement, through effective inventory methods, alternative collaborations among hospitals and transfer-sale policies. The purpose of supply chain in the healthcare sector is to reduce costs (stock-keeping costs, ordering costs, out-of-stock costs, generic drug costs) while providing quality treatment to patients (prescription drug accessibility). The most important difference between the material stock control in the supply chain of prescription drugs and other stock control problems is that it allows the use of equivalent (generic) drugs. The agreement-free drugs addressed in this project (drugs that are purchased without an annual quota) are relatively high-cost drugs used for special cases such as cancer with a lower demand but a high variability. The use of generic drugs in lieu of such special drugs is only permitted in the event of scarcity. In such a case a less preferred alternative (more costly and/or clinically less effective) of the primary drug is used. Theoretical models to be developed within the scope of this project are expected to minimize the seasonal drug scarcity in the country, by taking into account the importance of out-of-stock events both in terms of their negative effect on treatment and on cost.

Investigating of the Low Temperature Mechanical Properties of Magnesium Alloys Developed by Thermo-Mechanical Processing

Abstract

Magnesium and its alloys have attracted immense interest in recent years with increasing demand for lightweight structural components in many engineering applications. In today's designs, there has been a considerable increase for the requirement of similar performance under various service conditions. In this respect, efficient utilization of magnesium alloys is expected under various conditions. To achieve this functionality, utilization of thermo-mechanical processing for the development of suitable microstructures requires a detailed study. In this project the methods of strengthening for the model alloy is examined in the light of thermo-mechanical processing and the strength and impact properties are probed in relation to the microstructural development. Success in these efforts will be provided by advanced characterization techniques. This research project encompasses the description of microstructure tailoring techniques for promoting the application of magnesium alloys in various applications requiring high mechanical strength. With the aid of novel thermo-mechanical techniques, it is expected to obtain high strength magnesium alloys. The project will be carried out at Ozyegin University. Important contributions to the literature are expected on the present material system, arising from the determination of mechanical behavior under changing loading and temperature conditions. The outcomes of this work will form a fundamental knowledge base for both civil and military applications. The development of impact resistant magnesium alloys will be beneficial for various stake-holders in need of lightweight structural designs.

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Mechanical Engineering

Funding Scheme: TÜBİTAK 3501
Start Date: October 1, 2015
Duration: 24 Months
Budget: 289,500 TL

TÜBİTAK

Spoofing Attacks to Speaker Verification Systems Using Hidden Markov Model Based Noisy Speech Synthesis

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Funding Scheme: TÜBİTAK 1002
Start Date: October 1 , 2015
Duration: 12 Months
Budget: 30,000 TL

TÜBİTAK

Abstract

The project has two goals. The first goal is to improve the HMM-based synthesis technology for more effective speaker adaptation. To that end, k-nearest neighbor and spectral clustering algorithms will be used for generating target-specific speaker-independent models which is expected to enable rapid speaker adaptation with limited adaptation data. The second goal is to design noises and add them to specific parts of the synthesized speech for masking the artifacts and reducing the detectability of the sythesized speech. Both of those goals are novel and have not been studied in the literature. For example, impact of noise on detection of synthetic speech was never investigated before. The proposed research not only has high potential for publication, but also holds the potential to open new areas of research and receive citations. Results of the methods that will be investigated to achieve the goals of the project are of major importance to banks and intelligence organizations that are currently using the speaker verification systems. Moreover, the speech synthesis and adaptation algorithms proposed here are expected to make impact outside the context of this project. For example, generating target-specific k nearest neighbor and spectral clustering methods can make a big impact in rapid speaker adaptation of HMM-based speech synthesis systems.

Nonlinear Decision Rules

Abstract

The research proposes nonlinear decision rules to be used in adjustable robust optimization. Recent studies have shown that linear and segregated decision rules yield significant improvements to static robust optimization. Nevertheless, nonlinear decision rules have not been considered in the associated literature because they result complex non-linear robust counterparts. In the project, the researcher proposes tractable safe approximations of these complex reformulations using modern optimization techniques. The proposed methodology will be applied in real-life problems.

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Industrial Engineering

Funding Scheme: TÜBİTAK 2232
Start Date: September 1, 2015
Duration: 24 Months
Budget: 18,370 TL

TÜBİTAK

Factors that Influence the Value of Portfolios of Customers in Mergers and Acquisitions

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Funding Scheme: TÜBİTAK 2232
Start Date: July 14, 2015
Duration: 12 Months
Budget: 15,500 TL

TÜBİTAK

Abstract

Customer portfolios of target firms account for significant portion of the purchase price in mergers and acquisitions. For example, Yahoo reported that the customer relationships accounted for 51% of the total purchase price the firm paid for Seven Networks. Does the concentration of customer base of the target firm and/or the acquirer firm affects the value of customer relationships? Does the strategic asset base of the acquirer firm influence the value of customer relationships of target firms? By addressing these questions, the objective of the project is to provide empirical evidence on the relationship between marketing strategies and the value of customer relationships.

Optic Wireless Communication Excellence Center

Abstract

Optic Wireless Communication is one of the most recent and vital technological fields, which has a huge potential of opening a new era in communication sector. In this sense, the purposes of this project are to create a common space for technology and knowledge transfer and production as well as cooperated research projects and R&D activities and to facilitate the production of solutions for optic wireless communication by local facilities through industry – university partnership. In line with the recent development in the world, Istanbul urgently needs a large and developed R&D infrastructure to actively involve in this advanced and knowledge-intense technological area, and to manufacture high-tech optic wireless communication based products and services with a high added value. In full accordance with the general objective of the project, Optic Wireless Communication Excellence Center (OKATEM) aims at establishing an R&D infrastructure with a high capacity to compete similar institutions all around the world.

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Funding Scheme: İSTKA
Start Date: September 1, 2015
Duration: 12 Months
Budget: 1,373,479 TL

İSTANBUL KALKINMA AJANSI

International Training, Certification, and Development Center for LED

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Mechanical Engineering

Funding Scheme: İSTKA
Start Date: September 1, 2015
Duration: 12 Months
Budget: 1,072,555 TL

Abstract

''The main purpose of this project is to contribute to the efforts to improve advanced technological developments such as energy-efficient LED technologies and to turn them into economical profits. Furthermore, the project aims at fostering industry, academia, and public sector partnership to facilitate technology transfer and to create a common ground for collaboration for further projects, and contribute to the advanced energy-efficient LED and electronics technological implementations in order to improve the quality of life in Turkey and globally. This project also seeks to improve the quality of service and technologies of industry by making a contribution to the transformation of LED Sector in Turkey. Finally the project also aims at integrating Turkish academia and industry to the world of LED Technologies at global level. As a part of project activities, it is aimed at developing and manufacturing advanced LED Technologies in Turkey by creating common work platforms and laboratories for universities and industry and designing new strategies towards technologies with high added value.

MakerLab

Abstract

The project is to establish a maker space, called Maker Studio, where Ozyegin University Engineering and Design students and outside entrepreneurs will have the opportunity to develop innovative, easy-to-commercialize hardware projects. With the acceleration program designed specially for Maker Studio, entrepreneurs will be able to develop their business model, get customer feedbacks, work with experienced mentors on business development and will be provided an extended network of investors as they are searching for capital during the incubation period. Entrepreneurs will get feedback from experienced mentors, academicians and designers, thus they will have the opportunity to learn as they are developing. Outcome of the project is a fully equipped maker space including machines like 3D printer, laser cut, milling machine and electronic equipment. Besides, the Maker Studio is going to be a design studio offering ready-to-produce platform. Hardware developing entrepreneurs will get entrepreneurship based design and business model development lectures, as they are getting feedback during the product development period.

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Funding Scheme: İSTKA
Start Date: August 1, 2014
Duration: 12 Months
Budget: 346,440 TL

İSTANBUL KALKINMA AJANSI

INTERNATIONAL GRANTS 2015

TRIBE: Training Behaviors Towards Energy Efficient Play It!

Abstract

TRIBE project aims to contribute to a citizens' behaviour change towards energy efficiency in public buildings, through their engagement in the experience of playing a social game, linked by ICT to real time data collected from 5 pilot buildings hosting around 1.300 regular users (employees, tenants…) and almost 12.000 eventual users (visitors). The targeted average energy savings in the pilots is 24,8% of the current energy consumption. TRIBE project will carry out serious game aims to engage more than 750.000 players by the end of the project, involving users of the targeted pilot facilities and their social networks. As a result of the analysis and developments accomplished using the pilot cases of the TRIBE project, and in addition to the game that will serve to collect all the relevant information, a whole and very broad number of tools and guidelines named TRIBE pack will be set up to be used by public building tenants and owners. The goal is foster the spread of the public building users behaviour change as well as to support the deployment of ICTs for energy efficiency among public building owners and operators.

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Department:
Center for Energy, Environment,
And Economy

Funding Scheme: EC Horizion 2020
EE-2014-2-RIA
Start Date: March 1, 2015
Duration: 36 Months
Budget: 217,500 EURO

Eye On Europe II: Erasmus for Young Entrepreneurs

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Department:
Center for Entrepreneurship

Funding Scheme: AB Erasmus+ Entrepreneurship Erasmus
Start Date: February 1, 2015
Duration: 24 Months
Budget: 75,626 EURO

Abstract

The project is a cross-border exchange programme funded by the EU between new and experienced entrepreneurs across Europe The exchange programme ERASMUS for Young Entrepreneurs connects aspiring, new and experienced entrepreneurs across Europe. Participants benefit from the mutual exchange of knowledge and experience and gain access to new European markets. During a 1-6 month stay at a host enterprise new entrepreneurs collaborate with experienced entrepreneurs and learn how to run a business. ERASMUS for Young Entrepreneurs is funded by the European Union. UnternehmerTUM coordinates the programme for new entrepreneurs and host entrepreneurs from Germany and supports participants during the application process and throughout the entire stay.

Erasmus+

Industry Education Collaboration for Achieving Vocational Qualification Project

Abstract

The project's aim is to foster the relationship between industry and education institutions to improve the quality and qualification of sectoral training and education in tourism industry. During the project, a series of activities including conferences, matching activities, vocational trainings, apprenticeship program will be held. A report about the relationship between sector and education institutions in tourism will be prepared and distributed among the stakeholders. The project will be in full partnership between Hilton Hotels and Özyeğin University School of Applied Sciences Department of Hotel Management.

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Department:
Hotel Management

Funding Scheme: LLP Transfer of Innovation
Start Date: September 7, 2015
Duration: 24 Months
Budget: 72,214 EURO

Education and Culture DG
Lifelong Learning Programme

The Influence of Cultural Factors on Trust in Automation

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Department:
Psychology

Funding Scheme: Carnegie Mellon (USAF Research Laboratory)
Start Date: March 14, 2015
Duration: 12 Months
Budget: 45,000 USD

Carnegie Mellon University

Abstract

Human interaction with automation is a complex process. Humans may fail to use automation when it would be advantageous (disuse), fail to monitor it properly when in use (misuse), or accept its recommendations and actions when inappropriate. Trust, conceived as an attitude leading to intentions resulting in user actions involving automation, has been frequently cited as a contributor to decisions about using and monitoring automation. It is generally believed that trust is dynamic and a user's prior experience with an instance of automation affects future behavior indirectly through changes in trust. While the reliability of the automation has a major influence on the operator's decision to trust and use automation, internal (e.g. personality) and external (e.g. cultural norms) factors can also significantly influence the level of trust. In other words, individual differences and cultural values greatly affect the trust behavior of people, which have been hypothesized and supported by various studies. While modeling trust, most of the work on cultural influences on trust has been done in the context of interpersonal trust. Moreover, most of the very limited work studying culture and trust in automation has been abstract and suggestive, without empirical validation. To address these issues, the overall objective of the research is to develop a fundamental understanding of general principles and factors pertaining to trust in automation, and how trust mediates reliance on automation across cultures in both theoretical and empirical perspectives. The proposal introduces preliminary hypotheses based on Hofstede's cultural dimensions and a more recent theory of cultural syndromes to be tested in this research.

Trust-based Fusion of Uncertain Information From Diverse Sources-3

Abstract

In modern military operations, decision makers need to be capable of obtaining and fusing information from diverse sources (e.g., sensors, humans, etc.). In order to make informed decisions, this fused information should be combined and reasoned with domain knowledge. Knowledge representation and reasoning formalisms based on Description Logics (DLs) have become appealing in recent years for reasoning about domain knowledge, because of their computational properties and practical benefits. However, these formalisms could not accommodate various types of uncertainty that exists in the information proved by the sources. That is, the information provided by the sources could be vague, noisy, incomplete, and even misleading; the existing extensions of DLs can handle only a limited subset of these. Therefore, for practical use, the existing reasoning mechanisms should be extended to deal with the uncertain information received from the sources. In this proposal, we aim for such a reasoning framework that extends Description Logics with Dempster-Shafer theory of evidence (DST) to represent and reason about uncertain information. The reasoning mechanisms provided by this framework should interleave and interfere with the fusion process and disregard the misleading information during the fusion by exploiting different strains of information such as domain constraints and knowledge about the sources. The ultimate aim of this project is to provide decision makers useful tools for reasoning over the noisy, incomplete, and misleading information provided by diverse sources.

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Department:
Computer Engineering

Funding Scheme: US Army
Start Date: June 17, 2015
Duration: 12 Months
Budget: 80,000 USD

2016 GRANTS

Accepted as of December 15, 2015 and will start in 2016

Spatio-Temporal Mapping Method for Post-Occupancy Evaluation of Outdoor Spaces in a University Campus

Abstract

This project provides the state of post-occupancy evaluation (POE) studies for outdoor space and introduces a new spatio-temporal mapping method to appease the need of a POE method in urban scale. This new method explores how individual urban studies such as outdoor thermal comfort, urban heat island (UHI), and space syntax could bring together under the heading of POE. POE, especially for indoor environments, as a process of systematically evaluating the performance of buildings has earned increased attention in recent years. Especially in a compact urban environment where people are exposed to high levels of environmental and mental stress in their daily life, the design of open spaces goes far beyond providing just a crossing place; it should also be healing – serving functional as well as mental needs. Outdoor POE studies are essential for the buildings, such as university campuses, which consist of different building groups and outdoor spaces used very often by occupants. The outdoor spaces are the social and cultural activity places of university campuses located out of the city for not only the students but also the academic and administrative staff. The relation between outdoor spaces and building groups, competency, usage period, accessibility, and interaction of micro-climatic factors need to be investigated from a holistic approach. The spatio-temporal mapping method proposes to visualize the database captured through POE process in order to make stakeholders integration. By using geographical information systems, the maps will be prepared with the data aggregated from user, space and microclimate environment. This method will be applied on a campus building out of the city.

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Department:
Architecture

Funding Scheme: TÜBİTAK 1001
Start Date: January 2, 2015
Duration: 24 Months
Budget: 416,000 TL

TÜBİTAK

Development of a Domestic Urea Injection System and Its Engine Tests

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Department:
Mechanical Engineering

Funding Scheme: TÜBİTAK 1003
Start Date: February 1, 2016
Duration: 36 Months
Budget: 2,300,000 TL

TÜBİTAK

Abstract

In a collaborative R&D project, ÖzÜ Mechanical Engineering Department and Ford Otosan R&D center, which is the largest and the most competitive R&D center among all automotive industries in Turkey, will develop components for the future low-emission diesel engine. Investigations and developments, which are related to fluid mechanics, systems control, optical measurement technologies, material design and production technologies will be conducted in a complementary manner, so that the know-how on the design and testing of critical components can be attained. The project will be led by Asst. Prof. Dr. Özgür Ertunç and supported by Asst. Prof. Özkan Bebek (researcher), Asst. Prof.Güney Güven Yapıcı (researcher), Prof. Dr. Pınar Mengüç (consultant), Prof. Dr. Orhan Alankuş (consultant, Okan University) and engineers of FORD-Otosan. With the help of 2.3 million TL budget, 4 doctoral and numerous masters and undergraduate students will be educated in this field. Moreover, modern and unique test systems will be established to analyze the performance of developed components.

Topographic Prediction Based Energy Management for Electric Vehicles

Abstract

Electric vehicles are now part of our lives. We need to increase the distance that can be traveled by a fully charged battery in order to boost the use of electric vehicles, which requires that the embedded computer controlling the vehicle runs intelligent energy management algorithms. To that end, our Faculty of Engineering has launched a new project entitled "Topographic Prediction Based Energy Management for Electric Vehicles". The project has recently been awarded under TUBİTAK 1003 Primary Subjects R&D Funding Program. Within the scope of the "Topographic Prediction Based Energy Management for Electric Vehicles" project, a team under the guidance of our own Assoc. Prof. H. Fatih Uğurdağ, M. Ali Gözüküçük, Hexagon Studio team leader and PhD student at Özyeğin University, and Prof. Hakan Temeltaş, Arbon executive, will develop, implement, and test predictive energy control algorithms based on GPS and topographic map.

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Department:
Electrical & Electronics Engineering

Funding Scheme: TÜBİTAK 1003
Start Date: February 1, 2016
Duration: 24 Months
Budget: 265,743 TL

TÜBİTAK

KGYS Smart Support Software Development Project

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Computer Engineering

Funding Scheme: TÜBİTAK 1007
Start Date: 2016
Duration: 48 Months
Budget: 1,500,000 TL

TÜBİTAK

Abstract

In this project, computer vision and machine learning will be adapted for human and object motion tracking, human detection, and recognition, as well as, object detection and tracking. A comprehensive application that is built on established database architecture will be developed for facilitating the access of valuable information by simple cues. System architecture will be designed for supporting multi-core CPUs for optimum resource usage. Finally, operators will easily be able to jump between important alarm triggers such as illegal zone accesses, left-over dangerous objects, etc. This research will generate publications in multiple fields, including machine learning, computer vision, image processing, multi-core optimization, and parallelization. The knowledge and technological progress that this research will generate will benefit the students at the Turkish institutes involved in this project, as well as greater general Turkish scientific community. This project aims for the state-of-the-art performances presented in the literature for respective algorithms and improve them whenever possible. The results of the project are expected to increase Turkey's international esteem and visibility in the fields of computer vision, machine learning, and parallelization.

Design and Development of an Upper Limb Exoskeleton Robot with Series Elasticity and High Torque Density

Abstract

Wearable exoskeleton robots appear to be efficient in robot-aided rehabilitation tasks,in particular, for regaining motor control abilities following a stroke. Present-day exoskeleton robots are specifically built for a single task and they are powered via rigid actuators. The main purpose of this study is to advance the present-day exoskeleton technology by designing and manufacturing a multi-functional upper limb exoskeleton robot that is powered via actuators with series elasticity and high torque density. The proposed system will be used as a therapeutic tool for passive, active and assist-as-needed robot-aided rehabilitation tasks, and as well as a diagnostic tool for motor control diseases. Furthermore, it will serve as a power augmentation tool thanks to its high-torque output actuators. Its passive compliant structures with series elasticity not only allows high fidelity force control but also makes the robot inherently safe, compared to its rigid counterparts. The study includes three phases: i) Design and manufacturing of a series elastic actuator module. ii) Mechatronic hardware design and realization for the exoskeleton robot. iii) Synthesis of control algorithms, together with the analyses of robustness and stability. As the result of this project, a stable and safe robotic exoskeleton system will be obtained to initiate clinical trials.

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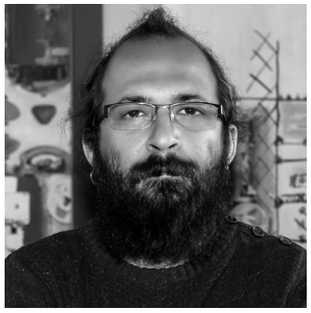
Mechanical Engineering

Funding Scheme: TÜBİTAK 2232
Start Date: 2016
Duration: 12 Months
Budget: 26,000 TL

TÜBİTAK

PLOTINA: Promoting Gender Balance and Inclusion in Research, Innovation, and Training



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Department:
Psychology

Funding Scheme: Horizon 2020 Geri-2014
Start Date: February 1, 2016
Duration: 48 Months
ÖzÜ Budget: 155,937 EURO

Abstract

PLOTINA's aim is to foster excellence and social value of innovations in research, by preventing the possible waste of female unstated talents and ensuring diversification of views and approaches (taking into account the gender dimension) in research within the 48 months allotted by the call. The project is particularly significant because despite the increase in the number of female researchers in Turkey and in Europe, and the fact that they mainly tend to work in the public sector, e.g. in the Universities, few of them have an equal opportunity to make a contribution and enjoy the benefits of a scientific career. Alongside the phenomenon of vertical segregation, also known as the "glass ceiling", widespread horizontal segregation leads the majority of females to be grouped in certain types of occupations, and, in general, the higher the position in the hierarchy, the lower the percentage of women. This lack of gender balance potentially limits the international competitiveness of research and the expression of the maximum of excellence. Accordingly, one aim of the PLOTINA project is to develop, implement, disseminate and measure the impact of novel Gender Equality Plans (GEPs). These GEPs will be designed in order to reduce the gender gaps in recruitment, retention career progression and decision-making processes in all occupational environments including the academia. The success of the implementations will be measured according to the sustainable cultural changes they will bring about for our institutions. Successful ideas will be shared with the public so that they can set examples for other institutions and countries. Moreover, the second goal of PLOTINA is to increase gender awareness in the scientific research practice. The inclusion of gender/sex dimensions in all types of studies, from basic research on mental mechanisms to the development of consumer goods, will not only broaden our understanding of interesting phenomena, but also motivate students and researchers to view their topic of study with a new perspective, i.e. gender. In short, PLOTINA will serve to establish more gender equality in the academia, and promote the practice of gender aware science.

Eye On Europe III: Erasmus for Young Entrepreneurs

Abstract

The project Eye on Europe is the continuation of Eye on Europe Project Concept. The third phase of Eye on Europe, as similar to previous phases is a cross-border exchange programme funded by the EU between new and experienced entrepreneurs across Europe The exchange programme ERASMUS for Young Entrepreneurs connects aspiring, new and experienced entrepreneurs across Europe. Participants bene t from the mutual exchange of knowledge and experience and gain access to new European markets. During a 1-6 month stay at a host enterprise new entrepreneurs collaborate with experienced entrepreneurs and learn how to run a business. ERASMUS for Young Entrepreneurs is funded by the European Union. UnternehmerTUM coordinates the programme for new entrepreneurs and host entrepreneurs from Germany and supports participants during the application process and throughout the entire stay.

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Department:
Center for Entrepreneurship

Funding Scheme: AB Erasmus+ Entrepreneurship Erasmus
Start Date: February 1, 2016
Duration: 24 Months
ÖzÜ Budget: 75,626 EURO

Erasmus+