



Faculty of Engineering and Natural Sciences

2014 Annual Report



Sabancı
Universitesi

FACULTY OF
ENGINEERING AND
NATURAL SCIENCES

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DEAN'S MESSAGE

I am pleased to share with you the activity report of the Faculty of Engineering and Natural Sciences (FENS) for 2014 Calendar Year. The report contains both numeric data and also some news and highlights about our academic activities.

I am pleased to share with you the activity report of the Faculty of Engineering and Natural Sciences (FENS) for 2014 Calendar Year. The report contains both numeric data and also some news and highlights about our academic activities.

Fifteen years after admitting its first students, FENS is continuing to grow in numbers. FENS graduated 328 undergraduate and 114 graduate students in 2014. More than 75% of Sabancı University (SU) students, who declared major in 2013-14 Academic Year, chose a major in FENS Programs. Our current undergraduate student enrollment is 1845. FENS Graduate Programs have 469 students as of Fall 2014-15 and we are eager to continue expansion of our graduate school with motivated students. To meet the growing demand and to excel further in education and research, FENS also aims to hire new faculty members in various areas. I would like to invite highly motivated students and researchers from all over the world to apply to our graduate programs and to the advertised faculty member positions.

Our research activities and graduate students are mainly supported by external funding through research projects. Our performance continues to get better in research funding. The ongoing project budget of FENS and SUNUM (SU Nanotechnology Research and Application Center) is about 68 million TL (around 29 million USD and 24 million Euros) as of the end of 2014. You will find brief information about some of our projects in this report.

Our growth continues not only in numbers but in all aspects of education and research. FENS started a new professional master program in Data Analytics in 2014 and admitted 24 students in the first year. We are collaborating with IBM Türk and Deloitte Turkey in Data Analytics Program. In collaboration with IHP-Microelectronics we formed a virtual research lab. Construction of a Center in Composite Technologies started towards the end of 2014. This will be a joint center of SU and Kordsa, a globally recognized Sabancı Holding company. Other than research, the center also aims to provide an environment for students doing Industrial PhD in composite and related technologies. This center will be a model for university-industry partnership in research and education for the country.

2014 brought recognition of our efforts in both education and research from national and international ranking agencies. SU entered the Times Higher Education (THE) World University Rankings for the first time in 2014 and this was an impressive first step: SU was ranked 182nd, making it the highest ranked foundation university in Turkey. In THE BRICS and Emerging Economies Rankings, SU was listed as the 15th school. Finally, SU was ranked 2nd in the Ministry of Science, Industry and Technology's "University

Entrepreneurship and Innovation Index" in 2014. Since its initiation, SU has been ranked in top 2 in this local university ranking. We are so lucky to do what we like to do most and it is even better when our efforts are recognized by respected agencies.

I would like to thank our faculty members, students and administrative staff for their efforts throughout the year and wish all FENS family an even more successful 2015.

Yusuf Menceloğlu

Dean

Faculty of Engineering and Natural Sciences

HIGHLIGHTS

New Comers



Meltem Elitaş

Meltem Elitaş is a faculty member at Sabancı University since December 1st, 2014. She did her postdoctoral research in the Bioengineering Department at Yale University, Connecticut, US. She was working with Prof. Rong Fan's research group, developing microfluidic artificial tumor microenvironment assays to study cancer heterogeneity and cancer-immuno interaction. She received her Ph.D. degree in Bioengineering and Biotechnology from École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland in 2012 where she worked with Prof. John McKinney, Prof. Sebastian Maerkl, and Prof. Philippe Renaud on understanding mycobacterium persistence at single cell level using microfabricated tools. She received her M.S. degree in Mechatronics Engineering from Sabancı University, Istanbul, in 2007 where she worked with Prof. Asif Şabanoviç's research group studying function based control. Her B.Sc. is in Electrical Engineering from Yıldız Technical University, Istanbul, in 2005. Meanwhile she studied Mathematical Engineering as a double major. Her research interests are phenotypic heterogeneity in cancer and infectious disease, single-cell microfluidic technologies, real-time drug responses, live cell imaging, robotic surgery, surgery tools, control systems, motion control, and MEMS.



Kamer Kaya

Kamer Kaya is an Assistant Professor in the Faculty of Engineering and Natural Sciences of Sabancı University. He received his Ph.D. on Computer Engineering from Bilkent University in 2009, and has previously worked as a Post-Graduate Researcher in CERFACS (Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique), France, and as a Research Assistant Professor in the Department of Biomedical Informatics of the Ohio State University. His research interests include parallel and high performance computing, network analysis, bioinformatics, and cryptography. In particular, he is interested in designing and implementing parallel kernels and algorithms to fully utilize cutting-edge, high-performance computing architectures for challenging problems we encounter in practice such as finding the central people in the Facebook network, high-throughput sequence alignment, or solving large-scale, linear systems.

Data Analytics: New Professional Master's Program

Data volumes are growing exponentially in all fields and industries. With the abundance of data available, there is a great potential to create business value and gain a competitive edge for all industries. The emerging field of Data Analytics holds the key to unleashing that potential. Most critical issue, however, is the shortage of analytical talent that could turn the high-volume data into useful information that will be used for better decision making. Professionals holding a degree in Data Analytics will be well positioned to help their organizations gain a competitive advantage in a data-driven world. The new Professional Master's Program in the Faculty of Engineering and Natural Sciences is designed and launched to provide our students with the skill set they need for careers in analyzing the increasing volumes of data that keep accumulating.

The curriculum is designed with flexibility to provide skills in many different aspects of Data Analytics and includes a wide variety of courses such as: Programming, Data management and data processing, Data mining, Machine learning, Statistical models for data analysis, Optimization, Decision modeling, Exploratory data analysis and visualization, Social network analysis, Data privacy, security and forensic discovery, Information security law, Business communication, Project management, a capstone project and more.



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Deloitte.

IBM and Deloitte are in collaboration with the Data Analytics Program as the strategic education partners. The idea behind this collaboration was to bring these global institutions' invaluable experience into the classroom and provide the students with the industrial perspective through use cases and case studies.

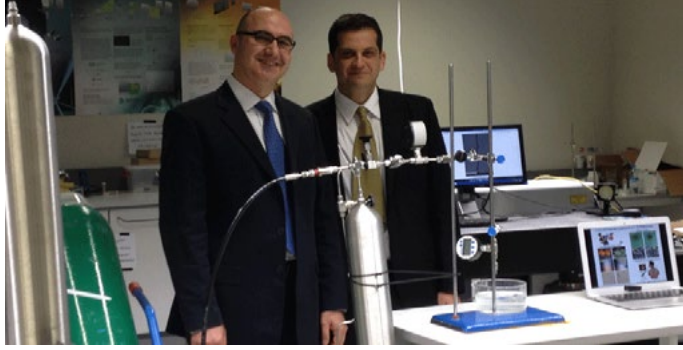


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DOĞA BİLİMLERİ
FAKÜLTESİ

IBM

Featured Projects

SUTAB Project



Sabancı University Faculty of Engineering and Natural Sciences members Professor Ali Koşar and Professor Devrim Gözüaçık and their teams used the erosive power of water micro-bubbles obtained by the cavitation method to design a medical device that eliminates kidney stones, prostate growth, cancer and tumors.

The water gun-like device named SUTAB (Sabancı University Tissue Ablation with Bubbles Medical Device) is a breakthrough in the treatment of kidney stones, prostate growth, cancer and tumors. The device targets cancer cells and tumors without harming healthy tissues and cells, and provides an affordable and completely harmless method of cancer treatment.



The micro cavitation technique uses the high levels of energy obtained when bubbles formed as a result of lowered water pressure collapse to target and eliminate cancer cells. This causes no harm to healthy tissues and eliminates cancer cells only. By targeting the erosive power of bubbles precisely, the same technology may be used to eliminate tumors, kidney stones and prostate growth.

SUTAB will be the first device of its kind to be manufactured in Turkey. SUTAB will provide an affordable and completely harmless method of cancer treatment. The medical use of hydrodynamic cavitation, the principle behind SUTAB, is patented to Sabancı University scientists, which gives the device competitive edge worldwide. With the integration of SUTAB to an endoscopic probe, Turkey will have its first multifunction cancer treatment device developed with native patented technologies.

Significant contributors to the development of a robotically controlled endoscope as part of the project are engineers Professor **Mustafa Ünel** and Professor **Asif Sabanovic** of Sabancı University; urologist and surgeon Professor **Sinan Ekici** of Maltepe University; pathologist Professor **Işın Doğan Ekici**, MD of Yeditepe University and engineer Professor **Hüseyin Üvet** of Yıldız Technical University. Also contributing to the project are Sabancı University's Molecular Biology experts **Dr. Özlem Oral** and **Dr. Cenk Kığ**.

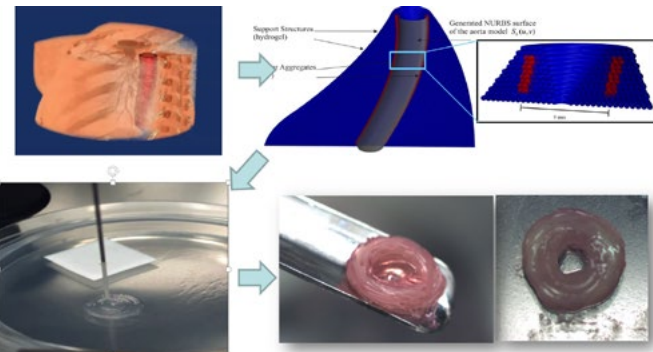
3D Printing of the Aorta Tissue Project

In this project, for the first time, macro-vascular tissue constructs were 3D printed by using self-supported live cells directly from medical images at the 3D Tissue and Organ Printing Lab.

Sabancı University Faculty of Engineering and Natural Sciences Industrial Engineering Program professor Bahattin Koç and his team printed an artificial macro-vascular tissue construct using self-supported live cells at the 3D Tissue and Organ Printing Lab, Nanotechnology Research and Application Center (SUNUM).

The team was the first in Turkey and the world to use MR data to recreate an anatomically correct aortic tissue construct by using self-supporting live cell printing. The project team used live cells in a 3D bio-printer to create an anatomically correct human aortic tissue construct directly from medical images. Different from other techniques, the 3D structures printed by Sabancı University scientists are self-supported in 3D.

The ultimate goal of the 3D tissue and organ printing group led by Prof. Bahattin Koç is to use three-dimensional bio-printers to print anatomically correct parts of or an entire tissue/organ by using the patient's own regular cells or stem cells. Because the patient's own cells are used, transplant rejection may not be a problem anymore.





Collaborations-Partnerships

SU - IHP Microelectronics

The Microelectronics Research Group of the Sabancı University Faculty of Engineering and Natural Sciences has been undertaking successful cooperation projects with the leading German scientific center IHP-Microelectronics since 2008. The two cutting-edge institutions now join their scientific experience and resources in a Microelectronics – Joint Virtual Excellence Lab based on the “More-than-Moore” concept. This initiative is expected to take scientific studies to a new level that is novel to Turkey and rare abroad as well, leading to more effective studies both in Turkey and on a European level. The motto of the More-than-Moore concept is to develop smaller, functional, economical, versatile and long-lasting electronic systems. This has potential to contribute to many industries including communication, biomedicine, aerospace, aviation, security, automotive and robot-automation.



The lab was established at the signing ceremony and conference held at the SUNUM facility on the Sabancı University Tuzla campus on Thursday, October 16, 2014, hosted by Sabancı University President Professor Nihat Berker and attended by IHP-Microelectronics Rector Professor Bernd Tillack, the German Federal Ministry of Education and Research, and representatives from the Turkish Ministry of Science, Industry and Technology, TÜBİTAK, and related sectors.

About the Sabancı University Faculty of Engineering and Natural Sciences Microelectronics Research Group

Led by Professor Yaşar Gürbüz, the Sabancı University Microelectronics Research Group conducts research and development of CMOS and SiGe-BiCMOS based integrated devices, circuits and system solutions, MEMS, detectors/sensors & actuator solutions for wireless communication, biomedical and medicine, surveillance and security, aerospace and industrial applications. The Group also has micro and nanofabrication capabilities provided by Sabancı University Nanotechnology Research and Application Center (SUNUM). <http://microsystems.sabanciuniv.edu/>



IHP-Microelectronics

The IHP is an institute of the Leibniz Association and conducts research and development of silicon-based systems and ultra high-frequency circuits and technologies including new materials. It develops innovative solutions for application areas such as wireless and broadband communication, aerospace, biotechnology and medicine, automotive industry, security technology and industrial automation. The IHP employs approximately 300 people. It operates a pilot line for technological developments and the preparation of high-speed circuits with 0.13/0.25 BiCMOS technologies, located in a 1000 m² class 1 cleanroom. <http://www.ihp-microelectronics.com/en/start.html>

Composite Technologies Center of Excellence

Kordsa Global, a Sabancı Holding company, and Sabancı University held the groundbreaking ceremony for the Composite Technologies Center of Excellence, in December 2014. The Center will be the product of an innovative industry-university partnership model and will work on composite material technologies. The Center will also be a platform that will combine advanced materials, R&D, academic structure and production. The center will be built with an investment of 65 million TL and provide facilities for graduate education, fundamental research,

applied research, product development, incubation services and commercialization opportunities in composite technologies.

The innovative model developed by Kordsa Global, the top-ranking company in the textile industry for two years in a row on the R&D Center Performance Assessment conducted by the Ministry of Science, Industry and



Technology on all R&D centers in Turkey since 2013, and Sabancı University, a top contender of the Most Entrepreneurial and Innovative Universities Index since 2012, will bring together students, faculty, researchers, engineers, entrepreneurs and designers together in the same room towards common goals.

The center will have an indoor area of 10,000 square meters with 3000 square meters of laboratory facilities where Kordsa Global and Sabancı University will create a breakthrough ecosystem fueled by doing research, learning and producing together. The high-tech production facilities provided by Kordsa Global will enable the domestic manufacture of materials and composites subject to import controls.



Attending the ceremony were Prime Minister Ahmet Davutoğlu, Deputy Prime Minister Yalçın Akdoğan, Minister of Science, Industry and Technology Fikri Işık, Minister of Development Cevdet Yılmaz, Governor of Istanbul Vasip Şahin, Sabancı Holding Board of Directors and Sabancı University Founding Board of Trustees Chair Güler Sabancı, Kordsa Global Board of Directors Chair Mehmet Pekarun, Sabancı University President Professor Nihat Berker, Sabancı University Board of Trustees Members Suzan Sabancı Dinçer and Sevil Sabancı, Kordsa Global CEO Cenk Alper as well as Sabancı Holding directors and the representatives of many companies and institutions that support the high technology initiative in Turkey.

Energy Research in Sabancı University

FENS faculty members from various disciplines carry out research in Energy. Same holds for several faculty members in other faculties of Sabancı University. Collective research areas in Energy are now available at the following link with their descriptions and researchers involved:

<http://fens.sabanciuniv.edu/en/energy-research-in-fens>

World Energy Outlook 2014

Sabancı University International Center for Energy and Climate (IICEC) in cooperation with TÜSİAD (Turkish Industry & Business Association) organized “World Energy Outlook 2014” Turkey Presentation at Sabancı Center. International Energy Agency (IEA) Chief Economist Dr. Fatih Birol presented the report. The introductory remarks were made by TÜSİAD President of the Board of Directors Haluk Dinçer and Minister of Energy and Natural Resources Taner Yıldız. FENS Energy Technologies and Management Professional Master Program students attended the presentation.



About World Energy Outlook

Issued by the International Energy Agency (IEA), the “World Energy Outlook” is the world’s most reputable, talked-about and sold publication in the energy industry that contains reliable energy market analyses, critical foresight into energy supply and demand trends, and comprehensive reviews of economic developments. Report contains the latest forecasts for the next 20 years, policy developments and recent analyses supported by the inferences of the past year. “World Energy Outlook” is a reference book for ministers of energy, economy and environment worldwide, enabling them to make the right investment decisions and accurate plans.

Joint Internship-Graduation Project

As of 2014, students of FENS have an option to carry out a 3 semester project, joining their summer internship and the senior graduation project. Students taking part in this joint program are supervised by an academic advisor from FENS and an advisor from the institution/company, where they do the summer internship. FENS collaborated with the following companies in 2014-15 academic year for this joint program: Promatech Professional Maritime Technologies, Netaş, CarrefourSA, EnerjiSA, IHP Microelectronics, Appcent, Coca Cola, AirTies, Mondelez International.

Emeritus Appointment

Yuda Yürüm, Materials Science and Nanoengineering

Promotions

1 Associate Profesor has been promoted to Professorship:

Erkam Savaş, Computer Science and Engineering

4 Assistant Professors have been promoted to Associate Professorship:

Burç Mısırlıoğlu, Materials Science and Nanoengineering

Kemal Kılıç, Industrial Engineering

Murat Çokol, Molecular Biology, Genetics and Bioengineering

Nihat Gökhan Göğüş, Mathematics

Faculty Member Awards

Ali Koşar, IMECE (International Mechanical Engineering Congress and Exposition) 2014- ASME (American Society of Mechanical Engineers) MEMS (Microelectromechanical Systems) Organization Committee Best Paper Award

Ali Koşar and Kürşat Şendur, Yıldız Technical University Project Market Award, 2nd Place

Ahmet Onat, Ege University, '3. Ege Ar-Ge ve Teknoloji Günleri' kapsamında, Üniversite Patentleri Yarışması 'Magnet Movable Linear Motor' patenti, Award, 3rd Place

Ali Koşar, Science Academy 2014 Young Scientist Award (BAGEP)

Albert Erkip, Sabancı University First Year Courses Teaching Award, 1st Place

Bahattin Koç, Turkish Heart Foundation Edip Kürklü Award

Bahattin Koç, Elginkan Community Technology Award

Deniz Sezer, Turkish Academy of Science (TÜBA) Successful Young Scientist (GEBİP) Award

Devrim Gözüaçık, Prof. Dr. hc. Önder Öztunalı Science Award

Devrim Gözüaçık, TGC Sedat Semavi Health Sciences Award

Gözde İnce, Science Academy 2014 Young Scientist Award (BAGEP)

Hikmet Budak and Yusuf Menceloğlu, Chemistry R&D Project Market Award, 1st Place

İbrahim Burç Mısırlıoğlu, Science Academy 2014 Young Scientist Award (BAGEP)

İnanç Adagideli, TGC Sedat Simavi Sciences Awards, Honorable Mention

Nilay Noyan Bülbül, Science Academy 2014 Young Scientist Award (BAGEP)

Selim Balcısoy, IBM Global Faculty Award

Faculty Member Achievements

Müjdat Çetin joins the editorial board of the IEEE Transactions on Image Processing

Ali Koşar is elected to the Scientific Council (SC) of International Centre for Heat and Mass Transfer (ICHMT).



Faculty Members in Media

Bahattin Koç spoke about his project “3D Printing of the aorta tissue” on BBC World’s “Horizons”.

Selmiye Alkan Gürsel spoke about her project “Graphene” on CNN Türk.

H. Sait Ölmez, Berrin Yanıkoğlu and Yücel Saygın spoke about Big Data, its current state and future directions on CNN Türk.



Student /Alumni Achievements

Canan Dağdeviren (MSMAT '09) Elected as Junior Fellow by the Society of Fellows at Harvard University. Her fellowship will start in 2015. Canan was also elected to “Innovators Under 35 Turkey” by MIT Technology Review.

Buket Özkaya (PhDMATH '14) Received Post-doc scholarship from the Futur & Ruptures Program, which is jointly supported by the Institut Mines-Télécom and the Fondation Télécom. Buket’s Post-doc appointment will start in 2015 at Télécom ParisTech.

Saygın Topkaya (PhDEE student) received the Best Poster Award (1st Place) at the 11th Edition of IEEE AVSS conference (AVSS 2014), which was held in Seoul.

Rıza Alp Güler (MSEE student) received ISRAVISION “Computer Vision Award”.

Nima Tofighi (MSME student) received the ECCOMAS (European Community on Computational Methods in Applied Sciences) Scholarship.



Alumni in Academy

Elif Hocaoglu (PhDME '14), Post-doc, Advanced Robotics Department, Italian Institute of Technology

Kaan Yilancioglu (PhDBIO '14), Assis.Prof., Department of Molecular Biology and Genetics, Üsküdar University

Nurdagül Anbar (PhDMATH'12), Visitor at Max Planck Institute for Mathematics, Bonn; then Post-doc at the Technical University of Denmark

Sibel Şahin (PhDMATH'14) , Lecturer, Faculty of Engineering, Department of Natural and Mathematical Sciences, Özyeğin University

Iyad Hashlamon (PhDME'14) Palestine Polytechnic University Faculty Member

Uraz Cengiz Türker (PhDCS'14), Post-doc, Department of Computer Science, Brunel University

Ahmetcan Erdoğan (PhDME'14) Rice University Post-doct Research Fellow

Deniz Aslan (MSIE'14) University of British Columbia Phd Study

Gizem Selcan Çetin (MSCS'14) Worchester Polytechnic Institute Research Assistant

Mehmet Meriç İşgenç (BSEE'14) Carnegie Mellon University Phd Study

Uğur Koç (MSCS'14) University of Maryland at College Park-USA Teaching Assistant

Alp Özkan (BSMS'14) University of Southern California Phd Study

Aslı Bilginer (BSMS'14) University of Bath Master of Science

Batuhan Aşula (BSMS'14) University College London Master of Science

Berkay Erdal (BSMS'14) London Business School Master of Science

Ebru Canfesci (BSMS'14) University of Massachusetts Amherst Master of Science

Efe Tancı (BSMS'14) Adelphi University Master of Science

Gökçe Kahvecioğlu (MSIE'14) Northwestern University Phd Study

Gülçin Altınok (BSMS'14) Vrije Universiteit Brussels Master of Science

Gülperi Yalçın (MSBIO'14) Korea University Phd Study

Hazal Yılmaz (MSBIO'14) Waterford Institute of Technology Phd Study

Giray Havur (MSCS'14) Vienna University of Technology Phd Study

İnanç Pastırmacı (BSBIO'14) University of Edinburgh Research Assistant

Elçin Kaya (BSMS'14) Universitat Pompeu Fabra Master of Science

Fikri Küçüksayacıgil (MSIE'14) Iowa State University Research Assistant

Ece Kaya (BSMS'14) University of Sussex Master of Science

Meriç Kıran (BSME'14) King's College London Master of Science

Mohammad Hossein Nemati (MSEE'14) Northeastern University Master of Science

Muhammed Sadık Yıldız (BSBIO'14) Harvard University Phd Study

Birce Naz Karadağ (BSBIO'14) Karolinska Institutet Master of Science

Önder Erin (BSME'14) Carnegie Mellon University Phd Study

Mehmet Özer Höbek (BSMS'14) University of California, Los Angeles Master of Science

Özge Seçkin (BSMS'14) University College London Master of Science

Reza Pakdaman Zangabad (MSEE'14) Erasmus University Rotterdam Master of Science

Deniz Çavuşoğlu (BSMS'14) University of Amsterdam Master of Science

Yiğit Dallılar (BSME'14) University of Florida Phd Study

Yusuf Talha Tamer (MSBIO'14) UTS - University of Technology Sydney Phd Study

Zeynep Gözen Sarıbatur (MSCS'14) Vienna University of Technology Research Assistant

Işıl Top (BSMAT'14) Queen Mary University of London Phd Study

Umut Kodak (BSEE'14) University of California San Diego Phd Study



FENS Excellence in Teaching Award

Our outstanding graduate students received their certificates to acknowledge their teaching achievements in 2013-2014 Academic Year.

The Recipients, their programs and the courses they supported are as follows:

Aslıhan Muazzez Ünsal, PhD PHYS student, NS 101- Science of Nature I
İnanç Arın, PhD CS student, CS 201- Introduction to Computing
Murat Mustafa Tunç, MS IE student, MS 407- Investment Decision Making

Gürsel Sönmez Awards

Our colleague Dr. Gürsel Sönmez tragically passed away in 2006. In his short but brilliant academic life, he made important contributions to science. In order to commemorate his achievements and to inspire and encourage young scientists, an award is presented each year to selected graduate students of FENS who write distinguished MS or PhD Theses. The following students are the recipients of the Gürsel Sönmez Research Award in 2014.



Alperen Acemoğlu received MS degree in Mechatronics with a thesis titled “Effects Of Geometric Parameters And Flow On Microswimmer Motion In Circular Channels” under supervision of Serhat Yeşilyurt. He has been active in the research area of microswimming robots, which promise new methods of targeted drug delivery. He will continue as a PhD fellow at Italian Institute of Technology (IIT).



Nurşen Aydın received PhD degree in Industrial Engineering with a thesis titled “New Capacity Allocation Policies in Revenue Management” under supervision of Ş. İlker Birbil. She has made important contributions to the operations research revenue management area in her PhD work. She will join Brunel University, London, Business School.

Rüştü Umut Tok received PhD degree in Mechatronics with a thesis titled “Broadband Plasmonic Surfaces and Applications” under supervision of Kürşat Şendur. He has made significant contributions to the design, manufacturing, and characterization of nanoantenna surfaces with a broadband absorption, reflection and transmission response. R.U. Tok is also the recipient of the 2013 Leopold Felsen award and a 100K TÜBİTAK fund, which led to a spinoff company. He will continue as a Post-doc Researcher at Sabancı University.



Sinem Şaşmaz Muş received PhD degree in Physics with a thesis titled “High Energy Emission and Temporal Properties of Magnetars” under supervision of Ersin Göğüş. She has contributed significantly to the worldwide collection of observational data on magnetars, which are highly magnetized neutron stars. S.Ş. Muş became the first person in the world to use the Fermi telescope data to study magnetars. She will continue as a Post-doc Researcher at Sabancı University.



Süleyman Kardaş received PhD degree in Computer Science with a thesis titled “Security and Privacy in RFID Systems” under supervision of Albert Levi. He has contributed to the fields of communication security and applied cryptography, specifically considering security and privacy problems of radio frequency identification (RFID) systems. He will continue working at TÜBİTAK BİLGEM UEKAE (National Research Institute of Electronics and Cryptology).



Sakıp Sabancı Award for the Highest Ranking Undergraduate Student



Yasin Razlık graduated from the Computer Science and Engineering Program. He is a Computer Engineer at Open Business Software Solutions (OBSS)



Facts and Figures

STAFF PROFILE (Numbers)	(Numbers)
Professors	34
Associate Professors	45
Assistant Professors	15
TOTAL NUMBER OF FULL-TIME FACULTY MEMBERS	94
Post-doc	55
Full-time instructor	3
Researcher	6
Executive & Professional Staff	22

Program	Professors	Associate Professors	Assistant Professors	Instructor	Post-doc	Researcher	Total
Computer Science and Engineering	2	5	3		2		12
Electronics Engineering	2	9	1		5		17
Industrial Engineering	4	8	1		5		18
Information Technology			1	3			4
Materials Science and Nanoengineering	6	4	5		6		21
Mathematics	7	3	1		7		18
Mechatronics Engineering	2	8	1		4		15
Molecular Biology, Genetics and Bioengineering	4	4	1		7		16
Nano- Energy Technologies and Management			1				1
Nanotechnology Research and Application Center					15	6	21
Physics	7	4			4		15
Grand Total	34	45	15	3	55	6	158

EDUCATION

FENS offers undergraduate degrees in 6 disciplines, graduate degrees in 12 disciplines and minor honor programs in 3 disciplines.

- Computer Science and Engineering (BS-MS-PHD)
<http://cs.sabanciuniv.edu/>
- Electronics Engineering (BS-MS -PhD)
<http://ee.sabanciuniv.edu/>
- Industrial Engineering (BS-MS -PhD)
<http://msie.sabanciuniv.edu/>
- Materials Science and Nanoengineering (BS-MS -PhD)
<http://mat.sabanciuniv.edu/>
- Mechatronics (BS-MS -PhD)
<http://me.sabanciuniv.edu/>
- Molecular Biology, Genetics and Bioengineering (BS-MS -PhD)
<http://bio.sabanciuniv.edu/>
- Chemistry (minor BS)
<http://chem.sabanciuniv.edu/>
- Mathematics (minor BS-MS-PhD)
<http://math.sabanciuniv.edu/>
- Physics (minor BS-MS-PhD)
<http://phys.sabanciuniv.edu/>

Professional Graduate Programs

- Data Analytics
<http://da.sabanciuniv.edu/en>
- Energy Technologies and Management
<http://energy.sabanciuniv.edu/>
- Information Technology
<http://msit.sabanciuniv.edu/>
- Nanotechnology
<http://nano.sabanciuniv.edu/>

Freedom in Major Declaration

Unlike other universities in Turkey, where students are directly placed in various departments as they enter the university, Sabancı University gives its students a chance to decide their major after their first year and as late as their second year. This allows students to make more informed choices about their future. The following are declaration figures in 2013-2014 academic year at Sabancı University and particularly the undergraduate programs of FENS.

Declaration in 2013-2014 Academic Year

Faculty of Engineering and Natural Sciences	645	76%
School of Management	106	13%
Faculty of Arts and Social Sciences	94	11%
Total	845	100%

FENS Program Declarations		
BSBIO	29	4,5%
BSCS	70	10,9%
BSEE	35	5,4%
BSMS	366	56,7%
BSMAT	22	3,4%
BSME	123	19,1%
Total	645	
Percentage among FENS declarations		

- Faculty of Engineering and Natural Sciences 76%
- School of Management 13%
- Faculty of Arts and Social Sciences 11%



Facts and Figures

Undergraduate Student Enrollment	2014-2015 Fall
Undeclared	670
Computer Science and Engineering	139
Electronics Engineering	81
Manufacturing Systems Engineering	654
Materials Science and Nanoengineering	45
Mechatronics	202
Molecular Biology, Genetics and Bioengineering	54
Total	1845

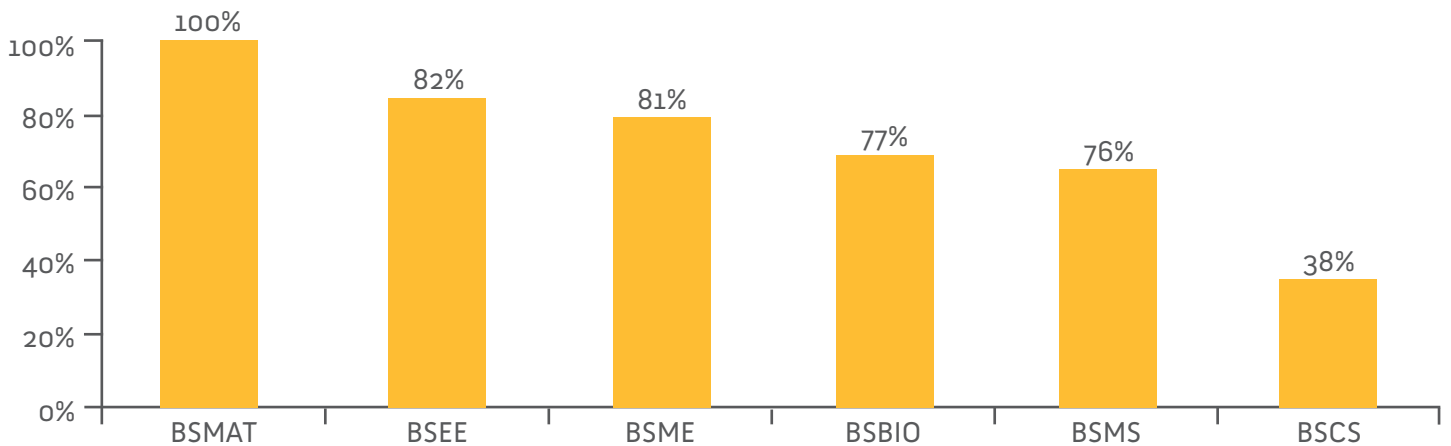
Graduate Student Enrollment	PhD	MSc	Total
Computer Science and Engineering	32	29	61
Data Analytics		24	24
Electronics Engineering	24	23	47
Energy Technologies and Management-Non Thesis		35	35
Industrial Engineering	18	32	50
Information Technology		46	46
Materials Science and Engineering	37	23	60
Mathematics	17	8	25
Mechatronics	28	21	49
Biological Sciences and Bioengineering	34	12	46
Nanotechnology- Non Thesis		4	4
Physics	21	1	22
Grand Total	211	258	469

Courses Offered in 2014*

	Level	Total
Computer Science and Engineering	Graduate	13
	Undergraduate	25
Electronics Engineering	Graduate	20
	Undergraduate	22
Energy Technologies and Management	Graduate	12
Industrial Engineering	Graduate	10
	Undergraduate	47
Information Technology	Graduate	14
Materials Science and Engineering	Graduate	14
Materials Science and Nanoengineering	Undergraduate	21
Mathematics	Graduate	17
	Undergraduate	25
Mechatronics	Graduate	7
	Undergraduate	17
Biological Sciences and Bioengineering	Graduate	14
Molecular Biology, Genetics and Bioengineering	Undergraduate	20
Nanotechnology	Graduate	8
Physics	Graduate	9
	Undergraduate	16
Total		331

(*) Fall, Spring and Summer courses are included.

4 - Year Undergraduate Students Graduation Rate



Alumni in 2014

Undergraduate Programs	Fall 2013-2014	Spring 2013-2014	Summer 2013-2014	Total
Computer Science and Engineering	8	19	5	32
Electronics Engineering	2	20	-	22
Industrial Engineering	30	147	36	213
Materials Science and Nanoengineering	-	5	-	5
Mechatronics Engineering	6	29	8	43
Molecular Biology, Genetics and Bioengineering	-	10	3	13
Total	46	230	52	328

Graduate Programs	PhD		PhD Total	MSc		MSc Total	Grand Total
	Fall 2013-2014	Spring 2013-2014		Fall 2013-2014	Spring 2013-2014		
Computer Science and Engineering	1	2	3	1	7	8	11
Electronics Engineering	2	2	4	2	8	10	14
Energy Technologies & Management					10	10	10
Industrial Engineering	-	3	3	5	10	15	18
Information Technology	-	-	-	3	9	12	12
Materials Science and Engineering	2	-	2	3	6	9	11
Mathematics	4	1	5	-	1	1	6
Mechatronics Engineering	-	6	6	3	6	9	15
Biological Sciences and Bioengineering	-	3	3	3	7	10	13
Nanotechnology					2	2	2
Physics	-	2	2	-	-	-	2
Grand Total	9	19	28	20	66	86	114

Application, Acceptance and Enrollment Statistics of Graduate Students

2013-2014 Spring										
	MSc					PhD				
	Application	Acceptance	Enrollment	Enroll/ Accept.	Accept./ Appl.	Application	Acceptance	Enrollment	Enroll/ Accept.	Accept./ Appl.
CS	16	5	3	60%	31%	13	4	2	50%	31%
EE	17	4	1	25%	24%	15	8	5	63%	53%
IE	13	7	5	71%	54%	7	3	2	67%	43%
MAT	13	7	4	57%	54%	9	6	2	33%	67%
MATH	3	2	1	50%	67%	3	3	1	33%	100%
ME	16	5	2	40%	31%	16	9	4	44%	56%
BIO	8	1	1	100%	13%	9	3	2	67%	33%
PHYS	No MSc in PHYS program					7	4	2	50%	57%

2014-2015 Fall										
	MSc					PhD				
	Application	Acceptance	Enrollment	Enroll/ Accept.	Accept./ Appl.	Application	Acceptance	Enrollment	Enroll/ Accept.	Accept./ Appl.
CS	35	10	7	70%	29%	27	6	5	83%	16%22
DA	36	31	24	77%	86%					
EE	45	12	6	50%	27%	29	12	3	25%	41%
ETM	9	0	0	-	0%	No PhD in ENE program				
ETM = Non Thesis	70	30	25	83%	43%					
IE	41	9	5	56%	22%	19	9	7	78%	47%
IT	69	33	22	67%	48%	No PhD in IT program				
MAT	36	12	9	75%	33%	29	10	3	30%	34
MATH	10	5	5	100%	50%	8	5	3	60%	63%
ME	34	17	12	71%	50%	21	7	4	57%	33%
BIO	51	6	2	33%	12%	34	9	5	56%	41%
Nano	18	1	0	0%	6%	No PhD in NANOT program				
Nano = Non Thesis	27	3	0	0%	11%					
PHYS	No MSc in PHYS program					17	7	2	29%	41 %

PhD Dissertations

Abdurrahman Eray Baran

PhD in Mechatronics (2013-2014 Spring)

“Assistive control for non-contact machining of random shaped contours”

Asif Şabanoviç (Thesis Advisor)

Ahmet Batal

PhD in Mathematics (2013-2014 Fall)

“Characterization of potential smoothness and Riesz basis property of Hill-Schrodinger operators with singular periodic potentials in terms of periodic, antiperiodic and Neumann spectra”

Plamen Djakov (Thesis Advisor)

Ahmetcan Erdoğın

PhD in Mechatronics (2013-2014 Spring)

“Optimal exoskeleton design and effective human-in-the-loop control frameworks for rehabilitation robotics”

Volkan Patođlu (Thesis Advisor)

Barıř Çakmak

PhD in Physics (2013-2014 Spring)

“Quantum correlations in spin chains and high energy symmetric states”

Zafer Gedik (Thesis Advisor)

Belma Yelbay

PhD in Industrial Engineering (2013-2014 Spring)

“Minimum hub cover problem: solution methods and applications”

Ş.İlker Birbil (Thesis Advisor)

Buket Özkaya

PhD in Mathematics (2013-2014 Spring)

“Multidimensional quasi-cyclic and convolutional codes”

Cem Güneri (Thesis Advisor)

Can Deha Karıksız

PhD in Mathematics (2013-2014 Fall)

“On m -rectangle characteristics and isomorphisms of mixed (f) -, (df) - spaces”

Vyacheslav Zakharyuta (Thesis Advisor)

Cengiz Örencik

PhD in Computer Science and Engineering (2013-2014 Spring)
“Privacy-preserving ranked search over encrypted cloud data”
Erkay Savaş (Thesis Advisor)

Elif Hocaoğlu

PhD in Mechatronics (2013-2014 Spring)
“Design and tele-impedance control of a variable stiffness transradial hand prosthesis”
Volkan Patoğlu (Thesis Advisor)

Emre Deniz

PhD in Biological Science and Bioengineering (2013-2014 Spring)
“The role of PATZ1 transcription factor in the DNA damage response”
Batu Erman (Thesis Advisor)

Erdem Öğüt

PhD in Mechatronics (2013-2014 Spring)
“Multilayer configurations with plasmonic transducers near magnetic layers”
Kürşat Şendur (Thesis Advisor)

Firuze Okyay

PhD in Materials Science and Engineering (2013-2014 Fall)
“Preparation and characterization of modified polyether ether ketone (PEEK-WC) membranes for polymer assisted ultrafiltration of Cu²⁺ ions from water”
Yuda Yürüm (Thesis Advisor)

Iyad Hashlamon

PhD in Mechatronics (2013-2014 Spring)
“Joint friction estimation and slip prediction of biped walking robots”
Kemalettin Erbatur (2013-2014 Spring)

Jaime Fernando Delgado

PhD in Electronics Engineering (2013-2014 Fall)
“Probabilistic graphical models for brain computer interfaces”
Müjdat Çetin (Thesis Advisor)

Kaan Yılcıoğlu

PhD in Biological Science and Bioengineering (2013-2014 Spring)
“Genetic, physiological and biotechnological assesment of microorganisms for renewable and sustainable energy resource production”
Selim Çetiner (Thesis Advisor)

Kayhan Eritmen

PhD in Electronics Engineering (2013-2014 Spring)

“Power optimization, network coding and decision fusion in multi-access relay networks”

Mehmet Keskinöz (Thesis Advisor)

Mahir Umman Yıldırım

PhD in Industrial Engineering (2013-2014 Spring)

“New approaches for determining the greenest paths and efficient vehicle routes on transportation networks”

Bülent Çatay (Thesis Advisor)

Nazlı Keskin

PhD in Biological Science and Bioengineering (2013-2014 Spring)

“Identification of PATZ1 transcription factor as a novel interacting partner and regulator of the p53 tumor suppressor protein”

Batu Erman (Thesis Advisor)

Nurşen Aydın

PhD in Industrial Engineering (2013-2014 Spring)

‘New capacity allocation policies in revenue management’
Ş. İlker Birbil (Thesis Advisor)

Özgür Deniz Polat

PhD in Mathematics (2013-2014 Fall)

“Decomposition of primes in non-Galois extensions”

Henning Stichtenoth (Thesis Advisor)

Serhan Coşar

PhD in Electronics Engineering (2013-2014 Fall)

“Sparse representation frameworks for inference problems in visual sensor network”

Müjdat Çetin (Thesis Advisor)

Shalima Shawuti

PhD in Materials Science and Engineering (2013-2014 Fall)

“Ionic conduction mechanisms in nanocomposite electrolyte and their relationship to microstructural features”

Mehmet Ali Gülgün (Thesis Advisor), Cleve Ow-Yang (Thesis Co-advisor)

Serdar Aksoy

PhD in Mechatronics (2013-2014 Spring)

“Coupled thermo-elastohydrodynamic analysis of a bump-type compliant foil journal bearing”

Mahmut F. Akşit (Thesis Advisor)

Sibel Şahin

PhD in Mathematics (2013-2014 Fall)

“Monge-Ampère measures and Poletsky-Stessin Hardy spaces on bounded hyperconvex domains”

Aydın Aytuna (Thesis Advisor)

Sinem Şaşmaz Muş

PhD in Physics (2013-2014 Spring)

“High energy emission and temporal properties of magnetars”

Ersin Göğüş (Thesis Advisor)

Süleyman Kardaş

PhD in Computer Science and Engineering (2013-2014 Spring)

“Security and privacy in RFID systems”

Albert Levi (Thesis Advisor)

Uraz Cengiz Türker

PhD in Computer Science and Engineering (2013-2014 Fall)

“Improvements in finite state machine based testing”

Hüsnü Yenigün (Thesis Advisor)

Yunus Sarıkaya

PhD in Electronics Engineering (2013-2014 Spring)

“Dynamical control of wireless networks with confidential communications”

Özgür Erçetin (Thesis Advisor), Özgür Gürbüz (Thesis Co-advisor)

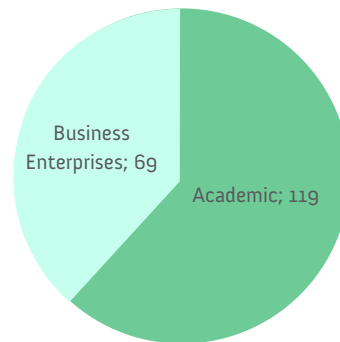
RESEARCH

Paralleling its academic programs, FENS research is concentrated on areas at the forefront of technology, from nanoscience to genetics and from robotics to the design of new materials. Both basic and applied research are carried out and encouraged in FENS. Our research is funded by national (such as TÜBİTAK) and international (such as FP7) agencies. An important aspect of FENS research is its interdisciplinary nature. Collaborative research with industry as well as contributions to high tech incubation and startup efforts are also among the fundamentals of the FENS research mission.

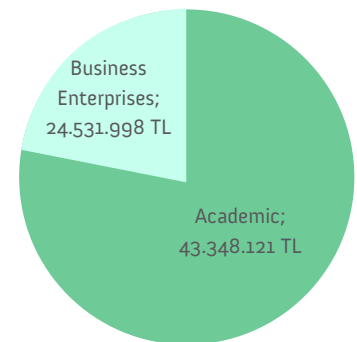
Facts and Figures

Project

FENS & SUNUM Projects (Ongoing)



FENS & SUNUM Projects TL (Ongoing)



START-UPS

Antsis Electronic is a leading design and manufacturing company specialized in RF & Microwave, Antenna Systems, Embedded Systems and Digital Design. We offer custom oriented solutions in these fields. **Kerem Özsoy – Rifat Türsen – İbrahim Tekin**

Punova Arge Kimya Sanayi ve Ticaret Anonim Şirketi is an R&D oriented chemical company located in Teknopark İstanbul offering custom and innovative polymer solutions to industries such as automotive, aerospace, construction, textile requiring high performance, functionalcoatings, adhesives and resins. **Fevzi Çakmak Cebeci - Ahmet Emir Özhalıcı – Yusuf Ziya Menceloğlu – Serkan Ünal.**

Surgitate produces synthetic tissue and organ models for surgery training. These products provide a realistic feel of incision, dissection, and suturing. Surgitate has breast, skin, and vascular models in its product portfolio and target customers of Surgitate are surgeons-in-training (e.g., medical and veterinary school students). The not-for-profit self-diagnosis breast model is used for breast cancer awareness as well. Surgitate aims to improve the quality of surgical trainings via a practical, tactile, and sustainable simulation platform. **Özge Akbulut – Barkın Eldem**



FIRST GRADE 'IMITATED' SURGERY

Patents Issued

Ahmet Onat; “Sandor Markon ‘Position Detection Device for Movable Magnet Type Linear Motor”

Ali Koşar; “An apparatus for using hydrodynamic cavitation in medical treatment”

Alpay Taralp; “Hidrazin ve metil türevlerinin sentezlenme yöntemi”

Aytül Erçil; Hakan Sakman “A vehicle camera”

Aytül Erçil, Gönen Eren; “A 3D Scanner”

İbrahim Tekin, Ayhan Bozkurt, Kerem Özsoy; “An Indoor Positioning System Based on GPS Signals”

Özgür Gürbüz , Özgür Ercetin, Yunus Sarıkaya, Cem Atalay; “A Method For Estimation of Residual Bandwidth”

Volkan Patoğlu; “A Reconfigurable Ankle Exoskeleton Device”

Yusuf Menceloğlu, Eren Şimşek, Kazım Acatay, Alpay Taralp; “Crosslinked Protein Nanocrystals, Crosslinked Protein Nanoaggregates and Method of Preparation Thereof”

SCI Journal Publications in 2014

FENS research areas and efforts are best presented by our publications. The following data is grouped into programs according to the affiliation of the faculty members, post-docs and researchers whose names are highlighted. Some joint-program publications are written separately at the end.

Computer Science and Engineering

Bilogrevic, I., Jadliwala, M., Joneja, V., Kalkan, K., Hubaux, J.P., Aad, I., "Privacy-preserving optimal meeting location determination on mobile devices", IEEE Transactions on Information Forensics and Security, vol. 9, 1141-1156, 2014.

Çiçek, A.E., Nergiz, M.E., Saygın, Y., "Ensuring location diversity in privacy-preserving spatio-temporal data publishing", VLDB Journal, vol. 23, 609-625, 2014.

Dehkharağhani, R., Mercan, H., Javeed, A., Saygın, Y., "Sentimental causal rule discovery from Twitter", Expert Systems with Applications, vol. 41, 4950-4958, 2014.

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Gökçe, G., Hatipoğlu, E., Göktürk, G., Luetgert, B., Saygın, Y., "Twitter and politics: identifying Turkish opinion leadres in new social media", Turkish Studies, vol. 15, 671-688, 2014.

Güniçen, C., İnan, K., Türker, U.C., Yenigün, H., "The relation between preset distinguishing sequences and synchronizing sequences", Formal Aspects of Computing, vol. 26, 1153-1167, 2014.

Kalkan, K., Levi, A., "Key distribution scheme for peer-to-peer communication in mobile underwater wireless sensor networks", Peer-to-Peer Networking and Applications, vol. 7, 698-709, 2014.

Karaoğlan, D., Levi, A., "A survey on the development of security mechanisms for body area networks", Computer Journal, vol. 57, 1484-1512, 2014.

Koç, E., Balcısoy, S., "Light source estimation in mobile augmented reality scenes by using human face geometry", IEICE Transactions on Information and Systems, vol. Eg7D, 1974-1982, 2014.

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Türker, U.C., Balcısoy, S., "A visualization technique for large temporal social network datasets in hyperbolic space", *Journal of Visual Languages and Computing*, vol. 25, 227-242, 2014.

Türker, U.C., Yenigün, H., "Hardness and inapproximability of minimizing adaptive distinguishing sequences", *Formal Methods in System Design*, vol. 44, 264-294, 2014.

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Electronics Engineering

Balocco, S., Gatta, C., ..., Ünal, G., ..., Downe, R.W., Kakadiaris, I.A., "Standardized evaluation methodology and reference database for evaluating IVUS image segmentation", *Computerized Medical Imaging and Graphics*, vol. 38, 70-90, 2014.

Coşar, S., Çetin, M., "Feature compression: a framework for multi-view multi-person tracking in visual sensor networks", *Journal of Visual Communication and Image Representation*, vol. 25, 864-873, 2014.

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Grais, E.M., Erdoğan, H., "Source separation using regularized NMF with MMSE estimates under GMM priors with online learning for the uncertainties", *Digital Signal Processing*, vol. 29, 20-34, 2014.

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Nemati, M.H., Kazemi, R., Tekin, İ., "Pattern reconfigurable patch array for 2.4 ghz wlan systems", Microwave and Optical Technology Letters, vol. 56, 2377-2381, 2014.

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Özcan, E., Kalali, E., Adıbelli, Y., Hamzaođlu, İ., "A computation and energy reduction technique for HEVC intra mode decision", IEEE Transactions on Consumer Electronics, vol. 60, 745-753, 2014.

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Industrial Engineering

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Pedrammehr, S., Mahboubkhah, M., Qazani, M.R.C., Rahmani, A., Pakzad, S., "Forced vibration analysis of milling machine's hexapod table under machining forces", *Strojnicki Vestnik-Journal of Mechanical Engineering*, vol. 60, 158-171, 2014.

Qazani, M.R.C., Pedrammehr, S., Nategh, M.J., "A study on motion of machine tools' hexapod table on freeform surfaces with circular interpolation", *International Journal of Advanced Manufacturing Technology*, vol. 75, 1763-1771, 2014.

Qazani, M.R.C., Pedrammehr, S., Rahmani, A., Shahyari, M., Rajab, A.K.S., Etefagh, M.M., "An experimental study on motion error of hexapod parallel manipulator", *International Journal of Advanced Manufacturing Technology*, vol. 72, 1361-1376, 2014.

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Suyabatmaz, A.C., Altekin, F.T., Şahin, G., "Hybrid simulation-analytical modeling approaches for the reverse logistics network design of a third-party logistics provider", *Computers and Industrial Engineering*, vol. 70, 74-89, 2014.

Wen, L., Çatay, B., Eglese, R., "Finding a minimum cost path between a pair of nodes in a time-varying road network with a congestion charge", *European Journal of Operational Research*, vol. 236, 915-923, 2014.

Zarandi, M.H.F., Hemmati, A., Davari, S., Türksen, İ.B., "A simulated annealing algorithm for routing problems with fuzzy constraints", *Journal of Intelligent & Fuzzy Systems*, vol. 26, 2649-2660, 2014.

Materials Science and Engineering

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