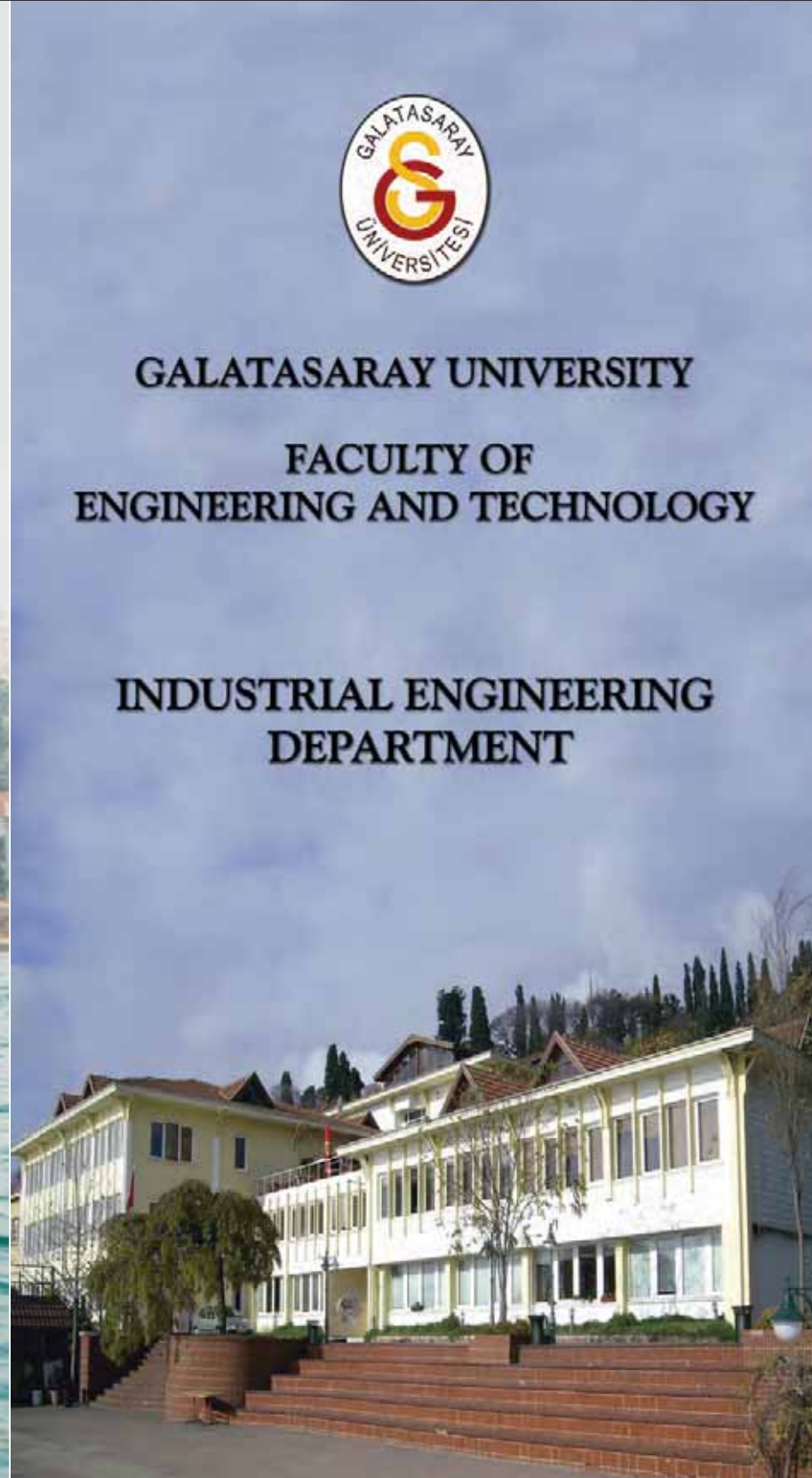




**GALATASARAY UNIVERSITY**

**FACULTY OF  
ENGINEERING AND TECHNOLOGY**

**INDUSTRIAL ENGINEERING  
DEPARTMENT**



## INTRODUCTION

Industrial engineering is an engineering field with the aim of continuous improvement of productivity, performance and quality of products and services during their life cycles. Industrial engineering focuses on the design and implementation of integrated systems of people, materials, machinery, energy and information.

The mission of the Industrial Engineering (IE) Department at Galatasaray University is to provide top quality education and a basis for lifelong learning of engineering and scientific knowledge required for analysis, design, improvement and evaluation of integrated complex systems. The curriculum of the IE Department is focused on providing an analytical framework for investigating and solving problems related to management and operations of manufacturing, service, and socio-economic systems. As of 2011, the IE Department has 14 full-time faculty members, who are fully committed to excellence in research and teaching, and a number of affiliated faculty.

The students of the IE Department are competently equipped in mathematics, and basic engineering and computer science skills, as well as in operations research, simulation, engineering economy and finance, production management, quality planning, management philosophy, and human resources management. The IE Department participates in the LLP/Erasmus exchange program, and has student exchange agreements with several prestigious European universities including INSA Lyon (Institut National des Sciences Appliquées de Lyon), Grenoble Institute of Technology (Institut National Polytechnic de Grenoble), Politecnico di Torino. Galatasaray University is a member of the Réseau Méditerranéen des Ecoles d'Ingénieurs (RMEI).



The students find the opportunity to apply their theoretical knowledge through compulsory summer trainings in leading national and international enterprises in Turkey and abroad. Although the medium of instruction in the under-graduate program is French, the students are also obliged to pursue English language courses throughout their education. Furthermore, the students have the opportunity to enhance their knowledge and skills in the state of the art Computer Integrated Manufacturing (CIM) laboratory as well as in the basic engineering and

science laboratories including undergraduate and graduate computer laboratories, physics and electronics laboratories. Moreover, students who meet the related criteria can pursue a double major in Computer Engineering.

The alumni of the IE Department have been employed in manufacturing, logistics, airline, banking and finance, and other service industries in leading national as well as multinational firms both in Turkey and



abroad, mainly in France, Belgium, the UK and the US. A number of our graduates have successfully completed their doctoral studies in highly reputable universities in France, Canada and the US, and some of them have been appointed to academic positions in France and Canada.



## STUDENTS

Admission to the IE Department is very competitive. Half of our undergraduate students are typically placed within the top 0.6 percent of those attending the nationwide Undergraduate Placement Examination organized by the Student Selection and Placement Board of the Turkish Higher Education Council. Due to the bilateral charter between Turkey and France enacted in 1992, the remaining half of our freshman class is admitted according to the results of the Internal Placement Exam of Galatasaray University from high schools where curriculum is in French. The medium of instruction in the undergraduate program is French, whereas the graduate program courses are conducted in English and Turkish.



The IE Department has awarded 451 Bachelor of Science (B.S.) degrees since 1997. The Graduate Institute of Science and Engineering offers two Master of Science (M.S.) programs related to the industrial engineering discipline, namely Master of Science in Industrial Engineering (MSIE) and Master of Science in Engineering Management (MSEM). As of 2011, 85 students have graduated from the MSIE program, and 129 students have graduated from the MSEM program. In addition, the Ph.D. Program in Industrial Engineering has been inaugurated in 2005. The current number of students enrolled in the Ph.D. program is 10 and 4 Ph.D. degrees have been awarded since 2010.



## UNESCO CHAIR IN COMPUTER INTEGRATED MANUFACTURING

Global competition in manufacturing environment has forced the firms to consider increasing the quality and responsiveness to customization, while decreasing costs. The installation of a computer integrated manufacturing system generally doubles the productivity and quality rates; therefore, the manufacturing firms, who wish to compete in the global markets, should monitor the developments in the CIM technology. Since 1997, the IE Department at Galatasaray University is UNESCO chairholder in Computer Integrated Manufacturing (CIM). The co-chairholders of UNESCO Chair at



Galatasaray University are Professor Ethem Tolga and Professor E. Ertuğrul Karsak. The UNESCO chair has played a significant role in enhancing the infrastructure of the IE Department through directing the construction of a CIM laboratory. The CIM laboratory was founded in 1999 to provide the students with knowledge and hands-on experience in the field of CIM and Robotics.

Turkey's key industries depend heavily on the ability of engineering schools to provide their students with modern and high technology manufacturing equipment to accompany their theoretical studies. The CIM laboratory presents the students the most advanced methods in various production processes. These modern methods are based upon the emerging technologies of flexible manufacturing systems and computer integrated manufacturing. They enable faster development of new and improved



products of high quality, shorter development and production cycles, faster delivery times, reduced production costs, and the ability to compete with the ever-changing demands of the global markets.

The main objectives of the CIM laboratory are as follows:

- To enhance the quality of industrial engineering education through related undergraduate and graduate courses, senior year projects, M.S. and Ph.D. theses.
- To educate students in a way to enable them to respond to the needs of modern and advanced manufacturing systems.
- To promote regional training, research, and information dissemination activities through the organization of continuing training programs, seminars and the development of collaborative projects.
- To establish scientific co-operation with internationally recognized researchers, other universities and research institutions, in both national and international levels.

## RESEARCH

The IE Department at Galatasaray University has a dynamic research environment. The IE department possesses young academics with international research experience. The faculty members and graduate assistants have on-line access to all major electronic databases related to industrial engineering and operations research as well as a rich selection of books and periodicals in Suna Kiraç Library.

The faculty members conduct research in various fields of industrial engineering and operations research including Decision Analysis, Multi-Criteria Decision Making, Applied Operations Research, Linear and Nonlinear Optimization, Global Optimization, Stochastic Programming, Simulation-Based Optimization, Meta-Heuristics, Reliability, Logistics and Supply Chain Management, Advanced Manufacturing Systems, Technology Selection, Product Development, Production Economics, and Real Options.



## FULL-TIME FACULTY MEMBERS

### Gülçin BÜYÜKÖZKAN FEYZİOĞLU, Ph.D.

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#### Academic Degrees

Ph.D.: Institut National Polytechnique de Grenoble, Industrial Engineering, 1999

M.S.: Bogazici University, Industrial Engineering, 1997

M.S.: Institut National Polytechnique de Grenoble, Industrial Engineering, 1996

B.S.: Istanbul Technical University, Industrial Engineering, 1993

#### Research Interests

- Modeling and analysis of logistics and supply chain management
- Modeling and analysis of sustainability
- Modeling and analysis of product development

#### Sample Publications

Büyükoğkan, G., Cifci, G., A novel fuzzy multi-criteria decision framework for sustainable supplier selection with incomplete information, *Computers in Industry*, 62(2), 164-174, 2011.

Kayakutlu, G., Buyukozkan, G., "Assessing performance factors for a 3PL in a value chain", *International Journal of Production Economics*, 131(2), 441-452, 2011.

Buyukozkan, G., Berkol, C., "Designing a sustainable supply chain using an integrated analytic network process and goal programming approach in quality function deployment", *Expert Systems with Applications*, 38(11), 13731-13748, 2011.

### E. Ertuğrul KARSAK, Ph.D., CFA

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#### Academic Degrees

Ph.D.: Istanbul Technical University, Industrial Engineering, 1994

M.S.: University of Southern California, Industrial & Systems Engineering, 1990

B.S.: Istanbul Technical University, Industrial Engineering, 1989

#### Research Interests

- Multiple criteria decision making
- Technology evaluation and selection
- Product development and quality function deployment (QFD)

#### Sample Publications

Karsak, E.E., Sener, Z., Dursun, M., "Robot selection using a fuzzy regression-based decision-making approach", *International Journal of Production Research*, DOI:10.1080/00207543.2011.627886, 2012.

Karsak, E.E., Özogul, C.O., "An Integrated Decision Making Approach for ERP System Selection", *Expert Systems with Applications*, Vol. 36, pp. 660-667, 2009.

Karsak, E.E., Sozer, S., Alptekin, S.E., "Product Planning in Quality Function Deployment Using a Combined Analytic Network Process and Goal Programming Approach", *Computers & Industrial Engineering*, Vol. 44, pp. 171-190, 2003.



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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 1979

M.S.: Istanbul Technical University, Industrial Engineering, 1975

B.S.: Istanbul Technical University, Industrial Engineering, 1973

**Research Interests**

- Engineering economy
- Decision support systems

**Sample Publications**

Ozogul, C.O., Karsak, E.E., Tolga, E., "A real options approach for evaluation and justification of a hospital information system", *Journal of Systems and Software*, 82 (12): 2091-2102, 2009.

Tolga, E, Alptekin, SE., "Product evaluation and development process using a fuzzy compromise-based goal programming approach", *Journal of Intelligent & Fuzzy Systems*, 19 (4-5): 285-301, 2008.

Tolga E., Demircan M.L., Kahraman C., "Operating system selection using fuzzy replacement analysis and analytic hierarchy process", *International Journal of Production Economics*, 97(1): 89-117, 2005.

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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 1992

M.S.: Istanbul Technical University, Industrial Engineering, 1986

B.S.: Bogazici University, Mechanical Engineering, 1984

**Research Interests**

- Project Management
- Waste Management

**Sample Publications**

Kop, Y., Ulukan, Z., Gürbüz, T., "Evaluating the failure risk level of an enterprise resource planning project using analytic network process in fuzzy environment", *Journal of Multiple Valued Logic and Soft Computing*, Vol:17., No.4, pp:407-422, 2011.

Ulukan, Z., Kop Y., "0-1 fuzzy goal programming approach to multiobjective waste paper collection method selection", *Journal of Multiple Valued Logic and Soft Computing*, Vol:15., pp. 251-262, 2008.

Kahraman, C., Ulukan, Z., "Investment analysis using forecasted cash flows by grey and fuzzy logic", *Journal of Multiple Valued Logic and Soft Computing*, Vol.14 No.6, pp.579-598, 2008.

**Y. Esra ALBAYRAK, Ph.D.**

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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 2004

M.S.: Istanbul Technical University, Management Engineering, 1986

B.S.: Istanbul Technical University, Management Engineering, 1984

**Research Interests**

- Statistics
- Fuzzy logic
- Decision analysis

**Sample Publications**

Albayrak, E., Erensal, Y.C., " Leveraging technological knowledge transfer by using fuzzy linear programming technique for multiattribute group decision making with fuzzy decision making with fuzzy decision variables " *Journal of Intelligent Manufacturing*, 20, 223-231, 2009.

Albayrak, Y.E., "A fuzzy linear programming model for multiattribute group decision making: an application to knowledge management", *Journal of Multiple Valued Logic & Soft Computing*, 14, 339-353, 2008.

Albayrak, E., Erensal, Y.C., "Using analytic hierarchy process (AHP) to improve human performance: an application of multiple criteria decision making", *Journal of Intelligent Manufacturing*, 15, Number 4, 491-503, 2004.

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**Academic Degrees**

Ph.D.: Bogazici University, Industrial Engineering, 2003

M.S.: Bogazici University, Industrial Engineering, 1998

B.S.: Istanbul Technical University, Industrial Engineering, 1996

**Research Interests**

- Design and modeling of manufacturing and logistics systems
- Urban transportation systems
- Industrial ecology and sustainable engineering

**Sample Publications**

Yamangil, E., Altinel, I.K., Çekyay, B., Feyzioglu, O., Özekici, S., "Design of optimum component test plans in the demonstration of diverse system performance measures", *IIE Transactions*, 43, 7, 535-546, 2011.

Feyzioglu, O., Pierreval, H., "Hybrid organization of functional departments and manufacturing cells in the presence of imprecise data", *International Journal of Production Research*, 47, 2, 343-368, 2009.

Büyükoçkan, G., Feyzioglu, O., Ersoy, M.S., "Evaluation of 4PL operating models: a decision making approach based on 2-additive choquet integral", *International Journal of Production Economics*, 121, 1, 112-120, 2009.

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**Academic Degrees**

Ph.D.: Bogazici University, Industrial Engineering, 2004

M.S.: Bogazici University, Industrial Engineering, 1998

B.S.: Istanbul Technical University, Industrial Engineering, 1996

**Research Interests**

- Combinatorial Optimization
- Design of Algorithms
- Supply Chain Management

**Sample Publications**

Oncan, T., Punnen, A.P., "The quadratic minimum spanning tree problem: a lower bounding procedure and an efficient search algorithm", *Computers and Operations Research*, Vol.37, pp. 1762-1773, 2010.

Akyüz, M.H., Öncan, T., Altinel, I.K., "The multi-commodity capacitated multi-facility Weber problem: heuristics and confidence intervals", *IIE Transactions*, Vol. 42, pp. 825-841, 2010.

Oncan, T. , Altinel, I.K., Laporte, G., "A comparative analysis of several asymmetric traveling salesman problem formulations", *Computers and Operations Research*, Vol. 36, pp. 637-654, 2009.

**S. Şebnem AHISKA, Ph.D.**

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**Academic Degrees**

Ph.D.: North Carolina State University, Industrial and Systems Engineering, 2008

M.S.: Galatasaray University, Industrial Engineering, 2003

B.S.: Istanbul Technical University, Industrial Engineering, 2001

**Research Interests**

- Stochastic processes
- Production planning and inventory management
- Applications of operations research

**Sample Publications**

Ahiska, S.S., King, R.E., "Life cycle inventory policy characterizations for a single-product recoverable system", *International Journal of Production Economics*, 124 , pp. 51-61, 2010.

Ahiska, S.S., King, R.E., "Inventory optimization in a one product recoverable manufacturing system", *International Journal of Production Economics*, 124, pp. 11-19, 2010.

Ahiska, S.S., Appaji, S.R., King, R.E., Wang, Y., Warsing, D.P., "Optimal ordering policy characterization in an unreliable supply chain", *Proceedings of the Industrial Engineering Research Conference*, Cancun, Mexico, 2010.

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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 2006

M.S.: Galatasaray University, Industrial Engineering, 2001

B.S.: Istanbul Technical University, Industrial Engineering, 1999

**Research Interests**

- Decision support systems
- New product development
- Quality engineering

**Sample Publications**

Alptekin, S. E., A fuzzy decision support system for digital camera selection based on user preferences, *Expert Systems with Applications*, doi: 10.1016/j.eswa.2011.08.166, 2011.

Alptekin, S. E., Karsak E. E., , An integrated decision framework for evaluating and selecting e-learning products, *Applied Soft Computing*, 11(3), 2990-2998, 2011.

Alptekin, S. E., Karsak E.E., E-learning product design using quality function deployment and fuzzy regression, *The Journal of Management & Engineering Integration*, 2, 83-91, 2009.

**M. Ebru ANGÜN, Ph.D.**

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**Academic Degrees**

Ph.D.: Tilburg University, Operations Research 2004

M.S.: Bogazici University, Industrial Engineering, 1998

B.S. Istanbul Technical University, Industrial Engineering, 1995

**Research Interests**

- Stochastic programming problem with chance constraints and their applications in disaster management and reverse logistics
- Two and multistage stochastic programming problems and their applications in disaster management and reverse logistics
- Simulation optimization methods and their applications to OR/MS problems

**Sample Publications**

Angun, E., Kleijnen, J., "An asymptotic test of optimality conditions in multiresponse simulation optimization", *INFORMS Journal on Computing*, Vol. 24 (1), doi: 10.1287/ijoc.1100.0438, 2012.

Angun, E., "A risk-averse approach to simulation optimization with multiple responses", *Simulation Modelling Practice and Theory*, Vol. 19 (3), pp. 911-923, 2011.

Angun, E., Kleijnen, J., Den Hertog, D., Gurkan, G., "Response surface methodology with stochastic constraints for expensive simulation", *Journal of the Operational Research Society*, Vol. 60, pp. 735-746, 2009.

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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 2006

MBA.: University of Pittsburgh Katz G.S.B., 1999

B.S.: Istanbul Technical University, Industrial Engineering, 1997

**Research Interests**

- Engineering economy
- Investment analysis
- Project management

**Sample Publications**

Tolga, A.C., Kahraman, C., Demircan, M.L., "A comparative fuzzy real options valuation model using trinomial lattice and Black-Scholes approaches: A call center application", *Journal of Multiple-Valued Logic and Soft Computing*, Vol. 16, 1-2, pp. 135-154, 2010.

Erensal, Y.C., Oncan, T., Demircan, M.L., "Determining key capabilities in technology management using fuzzy analytic hierarchy process: A case study of Turkey", *Information Sciences*, 176(18), 2006, 2755-2770, 2008.

Tolga, E., Demircan, M.L., Kahraman, C., "Operating system selection using fuzzy replacement analysis and analytic hierarchy process", *International Journal of Production Economics*, 97(1), 89-117, 2005.

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**Academic Degrees**

Ph.D.: Institut National Polytechnique de Grenoble, Industrial Engineering, 1999

M.S.: Institut National Polytechnique de Grenoble, Industrial Engineering, 1996

B.S.: Istanbul Technical University, Management Engineering Department, 1993

**Research Interests**

- Flexibility management
- Green design for LCA
- Waste management in reverse logistic

**Sample Publications**

Bereketli, I., Erol Genevois, M., Albayrak, Y. E., Ozyol, M., "WEEE treatment strategies' evaluation using fuzzy LINMAP method", *Expert Systems with Applications*, 38, pp. 71-79, 2011.

Erol Genevois, M., Yensarfati, D., "A flexibility based rapid response model in ready to wear sector, in Turkey", *Rapid Modelling and Quick Response: Intersection of Theory and Practice*, pp. 177-194, Springer-Verlag, London, 2010.

Erol Genevois, M., Albayrak E., "A fuzzy multiattribute decision making model to evaluate knowledge based human resource flexibility problem", *Journal of Multiple-Valued Logic and Soft Computing*, 2008.

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B.S.: Galatasaray University, B.S. in Industrial Engineering, 2003

**Research Interests**

- Multiple criteria decision making
- Quality function deployment
- Fuzzy optimization

**Sample Publications**

Sener, Z., Karsak, E.E., "A combined fuzzy linear regression and fuzzy multiple objective programming approach for setting target levels in quality function deployment", *Expert Systems with Applications*, Vol. 38, 3015-3022, 2011.

Sener, Z., Karsak, E. E., "A fuzzy regression and optimization approach for setting target levels in software quality function deployment", *Software Quality Journal*, Vol. 18, 323-339, 2010.

Sener Z., Karsak, E.E., "A decision model for setting target levels in quality function deployment using nonlinear programming-based fuzzy regression and optimization", *International Journal of Advanced Manufacturing Technology*, Vol. 48, 1173-1184, 2010.

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**Academic Degrees**

Ph.D.: Istanbul Technical University, Industrial Engineering, 2009

M.S.: Galatasaray University, Industrial Engineering, 2004

B.S.: Selçuk University, Civil Engineering, 1999

**Research Interests**

- Real options
- Innovation
- Renewable energy

**Sample Publications**

Tolga, A.C., "Fuzzy multi-criteria method for revaluation of ERP system choices using real options", *The International Conference of Computational Intelligence and Intelligent Systems (ICCIIS 2011)*, Vol. II, pp. 1074-1078, London, 2011.

Tolga, A.C., Kahraman, C., Demircan, M.L., "A comparative fuzzy real options valuation model using trinomial lattice and Black-Scholes approaches: A call center application", *Journal of Multiple-Valued Logic and Soft Computing*, Vol. 16, 1-2, pp. 135-154, 2010.

Kahraman, C., Tolga, A.C., "An Alternative ranking approach and its usage in multi-criteria decision-making", *International Journal of Computational Intelligence Systems*, Vol. 2 (3), pp. 219-235, 2009.