

Curriculum Vitae

İbrahim Beklan Küçükdemiral, Ph.D.

Personal Information & Contact

- **Born** Istanbul, August 18, 1975
- **Address** Chair of Control Systems, Department of Electrical Engineering, School of Electrical - Electronic Engineering, Yıldız Technical University, 34349, Beşiktaş, Istanbul, Turkey.
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Employment

- **2004 – ongoing** Assistant Professor
Yıldız Technical University, Department of Electrical Engineering, Chair of Control Systems
- **1998 – 2004** Research & Teaching Assistant
Yıldız Technical University, Department of Electrical Engineering, Chair of Control Systems
- **Summer, 1996** Apprenticeship
Diktas Thread Company, Istanbul, Turkey
- **Summer, 1995** Apprenticeship
[Türk-Telecom Factory](#), Istanbul, Turkey
[Nortel \(Netaş\) Networks](#), Istanbul, Turkey

Education

- **Ph.D, 2002** Electrical Engineering, Yıldız Technical University, (**GPA:3.63/4**)
Supervisor: Prof. Dr. Galip Cansever
Title: Design of Neural-Genetic Based Optimal Fuzzy Logic Controller and Application to a DC Servo-system

- **Ms, 1999** Electrical Engineering, Yıldız Technical University, (**GPA:3.64/4**)
Supervisor: Prof. Dr. Halit Pastacı
Thesis Title: Dynamic Velocity Control of a DC Servo Machine by Using TMS320C50 Digital Signal Processor
- **Bc.S, 1997** Electrical Engineering, Yıldız Technical University, (**GPA:76/100**)
Supervisor: Prof. Dr. Galip Cansever
Senior Thesis: The design of a Z-80 Microprocessor based mainboard and implementation of Stepper Motor Control
- **High School, 1993** Eyüboğlu High School, Istanbul, Turkey

Publications

Please see '[List of Publications](#)' on page 6

Administrative Duties

- **2004 – 2005** Deputy Head of Department of Electrical Engineering in Yıldız Technical University

Courses Taught

Undergraduate program

Automatic Control Systems
 Design of Control Systems
 Process Control
 Digital Systems
 Introduction to Multi-variable Control Systems
 Robot Modeling and Control
 Microprocessors (Turkish Air-force Academy)
 Discrete Control (Turkish Air-force Academy)

Graduate Program (Control & Automation Engineering)

System Theory
 Optimal Control
 Adaptive Control

International Scientific Activities

Invited Talk

- Delay Dependent Guaranteed Cost Control of LPV systems, DELFT Center For Systems and Control (DCSC), The Netherlands, July 3, 2008.

Organizations

- Member of Technical Program Chair in INISTA 2005 (*International Symposium on Innovations in Intelligent Systems and Applications*), June 15-18, 2005, Istanbul, Turkey

- Member of consultative committee in TOK'06, TOK'07 (Turkish Automatic Control Assembly)

Reviews

- IEEE Transactions on Fuzzy Systems
- Nonlinear Dynamics
- Journal of Intelligent and Fuzzy Systems
- American Control Conferences 2007, 2008
- Simulation Modelling Practice and Theory
- Gazi University Journal
- Sigma, Journal of Yildiz Technical University

Scientific Projects

- **Supervisor, Tübitak (1001) Research Project, 2009–2011** (*accepted*) 'Development and Optimal LPV control of an Active Suspension System Actuated by Linear Motors'
- **Member, Tübitak (Carrier) Project, 2006–2009** 6-axis, Stewart platform based man-machine interface for controlling objects with spatial motion from a single point with force feedback.
- **Member, University Research Fund, 2005 –2007** Trajectory Tracking of Robot Using Artificial Neural Networks, Fuzzy Logic and Sliding Mode Control.
- **Member, University Research Fund, 2001 – 2003** Spherical graphite cast iron pipe production with centrifugal melting procedure, Project No: 21-07-02-07

Language Skills

English (Fluent)

- Interuniversity Board Foreign Language Exam (83/100), Mar. 2005
- Foreign Language Exam for State Employees (70/100), Nov. 2000

Qualifications

- Certificate in C programming language (120 hours) (C & System Programmers Ass. Branch of Turkey) (Sept. 2000).
- Certificate in programming Twido, Micro, Premium PLCs - Magelis Operator Panels - ATV28 AC machine speed control applications (Schneider Training Center, Istanbul, 15/08/2003)

Area of Scientific Research

- Robust Control
- System Identification and Modeling
- Control of Active Vibration Systems
- Linear Parameter Varying (LPV) and Gain-Scheduled Control Systems
- Robust Control of Time-Delayed Systems
- Optimal Control Theory
- Mathematical System Theory (Linear & Some Classes of Nonlinear Systems)
- Adaptive Control Systems
- Fuzzy Logic Control
- Robotics and Control of Robot Manipulators

Computer Skills

Proficiency on \LaTeX , MATLAB (Specially, LMI, Control, YALMIP, Fuzzy Logic toolbox), C, Pascal, Assembly programming for 8031 family of microprocessors and Intel CPUs, TMS family of DSPs, Mathematica.

Course Work

Courses	Instructor	Institute
Fuzzy Logic Control (r)	G. Cansever	Yıldız Technical University
Applied Functional Analysis I (r)	M.E. Şuhubi	Istanbul Technical University
Applied Functional Analysis II (r)	M.E. Şuhubi	Istanbul Technical University
Optimal Control Theory (r)	M. K.Sarıoğlu	Istanbul Technical University
Advanced Control of Robot Manipulators (r)	H. Temeltaş	Istanbul Technical University
System Theory (r)	M. K. Çevik	Istanbul Technical University
Geometric Approach in System Theory	M. K. Çevik	Istanbul Technical University
Dynamics of Electrical Machines (r)	M. K. Sarıoğlu	Istanbul Technical University
Adaptive Control Systems (r)	F. Gürleyen	Istanbul Technical University
Introduction to Artificial Neural Networks (r)	C. Güzelış	Istanbul Technical University
Robust Control Systems (r)	A. Bir	Istanbul Technical University
Theory of Functions with Complex Variables (r)	I. Akduman	Istanbul Technical University
Nonlinear Control Systems	A. Bir	Istanbul Technical University
Design of Digital Control Systems (r)	A. Bir	Istanbul Technical University
Advanced Microprocessor Systems (r)	B. Örencik	Istanbul Technical University
Microprocessors and Power Electronics Applications (r)	G. Yıldırımaz	Yıldız Technical University
System Analysis (r)	Ş. N. Engin	Gebze Inst. of Sci. & Technology
\mathcal{H}_∞ Optimal Control Theory	L. Gören	Istanbul Technical University
Robust Control	I. E. Kose	Bogazici University

Note: Above, (r) stands for the registered courses

References

- **Prof. Dr. Galip Cansever**, Department of Electrical Engineering, Yıldız Technical University, Istanbul, Turkey. Tel:+902123832385, Fax:+902122594967, E-mail: cansever@yildiz.edu.tr
- **Prof. Dr. M. Külmiz Çevik**, Department of Electronic Engineering, Istanbul Technical University, Istanbul, Turkey, Tel:+902122853604, E-mail: mehmet.cevik@itu.edu.tr
- **Prof. Dr. Leyla Gören**, Department of Control Engineering, Istanbul Technical University, Istanbul, Turkey, Tel:+902122853579, E-mail: goren@elk.itu.edu.tr

List of Publications

Articles {SCI+National}

- [1] G. Cansever and I. B. Kucukdemiral. A new approach to supervisor design with sequential control Petri-Net using minimization technique for discrete event system. *International Journal of Advanced Manufacturing Technology*, 29:1267–1277, 2006.
- [2] B. Dalci, M. Uzunoglu, and I. B. Kucukdemiral. Genetic algoritim based optimal self tuning fuzzy logic power system static VAR stabilizer. *International Journal of Electrical Engineering Education*, 41:71–89, 2004.
- [3] A. Delibasi, E. Zergeroglu, I. B. Kucukdemiral, and G. Cansever. Adaptive self tuning control of robot manipulators with periodic disturbance estimation. Under Review.
- [4] S. N. Engin, I. B. Kucukdemiral, and G. Cansever. Parametreleri degisken DC servomotor icin PI tipi parametrik anlamda dayanıklı denetleyici tasarımı. *Journal of Dogus University*, 3:95–102, Jan. 2001.
- [5] I. B. Kucukdemiral. Delay dependent guaranteed cost gain scheduling control of LPV state-delayed systems. *Optimal Control Applications and Methods, Wiley Interscience*, 29:313–331, 2008.
- [6] I. B. Kucukdemiral and G. Cansever. Sugeno based robust adaptive fuzzy sliding-mode controller for SISO nonlinear systems. *Journal of Intelligent and Fuzzy Systems*, 17:113–124, 2006.
- [7] I. B. Kucukdemiral, S. N. Engin, V. E. Omurlu, and G. Cansever. A robust single input adaptive sliding mode fuzzy logic controller for automotive - active suspension system. *Lecture Notes in Computer Science*, 3613:981–986, 2005.
- [8] C. Onat, I. B. Kucukdemiral, S. Sivrioglu, and I. Yuksek. LPD kazanc programlaması kullanarak aktif süspansiyon denetleyicisi tasarımı. *Mühendis ve Makina*, 47:51–62, 2006.
- [9] C. Onat, I. B. Kucukdemiral, S. Sivrioglu, and I. Yuksek. LPV model based gain-scheduling controller for full vehicle active suspension system. *Journal of Vibration and Control*, 13:1929–1966, 2007.
- [10] C. Onat, I. B. Kucukdemiral, S. Sivrioglu, I. Yuksek, and G. Cansever. LPV gain-scheduling controller design for a nonlinear quarter-vehicle active suspension system. In Press, Transactions of the Institute of Measurement and Control.

Proceedings {International + National}

- [11] K. Gulez, H. Pastaci, and I. B. Kucukdemiral, "Neural network based estimation of speed and parameters for a vector controlled induction motor by using dsp," in *Proc. 2nd International Conference on Mathematical and Computational Applications in Engineering*, (Baku, Azerbaijan), Sep. 1–3, 1999.
- [12] I. B. Kucukdemiral, G. Cansever, and K. Gulez, "Design of a dynamic and robust speed controller for a DC servo motor by using a DSP," in *Proc. 2nd International Conference on Mathematical and Computational Applications in Engineering*, (Baku, Azerbaijan), Sep. 1–3, 1999.
- [13] I. B. Kucukdemiral, G. Cansever, and K. Gulez, "Synthesis inequalities for the robust PID controller for a DC servo motor and implementation by using DSP," in *Proc. International Conference on Signal Processing Applications and Technology (ICSPAT'99)*, (Orlando, Florida), Nov. 1–4, 1999.
- [14] I. B. Kucukdemiral and G. Cansever, "On methods for improving the performance of PD - type fuzzy logic controller for position control," in *Proc. Intelligent Manufacturing Systems (IMS)*, (Adapazarı, Turkey), Agu. 30–31, 2001.
- [15] G. Cansever, Y. M. Li, I. B. Kucukdemiral, and A. H. Jones, "Petri Nets based supervisor design for programmable logic controller," in *Proc. Intelligent Manufacturing Systems (IMS)*, (Adapazarı, Turkey), Agu. 30–31, 2001.
- [16] I. B. Kucukdemiral and G. Cansever, "A new method for the design of optimal self-tuning fuzzy logic controller by using genetic algorithms and artificial neural networks," in *Proc. 1st International Conference on Information Technology in Mechatronics*, (Istanbul, Turkey), Oct. 1–3, 2001.
- [17] I. B. Kucukdemiral, G. Cansever, and G. Yildirmaz, "Direct adaptive fuzzy logic controller with self-tuning input scaling factors," in *Proc. 4th Asian Control Conference*, (Siec, Singapore), Sep. 25–27, 2002.
- [18] I. B. Kucukdemiral, G. Cansever, and G. Yildirmaz, "Neuro-genetic based fuzzy sliding mode controller and PMDC motor control application," in *Proc. 2nd International Conference on Responsive Manufacturing*, (Gaziantep, Turkey), Jun. 26–28, 2002.
- [19] I. B. Kucukdemiral and G. Cansever, "Direct adaptive fuzzy -PI controller with resetting type self-tuning mechanism," in *Proc. 5th Portuguese Conference on Automatic Control*, (Aveiro, Portugal), pp. 1–6, Sep. 5–7, 2002.
- [20] V. E. Omurlu, S. N. Engin, and I. B. Kucukdemiral, "A robust single input adaptive sliding mode fuzzy logic controller for a nonlinear automotive suspension system," in *Proc. 12th Mediterranean Control Conference*, (Kuşadası, Turkey), Jun. 6–9, 2004.
- [21] E. Eroglu, G. Cansever, I. B. Kucukdemiral, and B. Dalci, "Pd, pid and fuzzy logic control of three link planar arm," in *Proc. 4th International Workshop on Robot Motion and Control (ROMOCO'04)*, (Puszczykowo, Poland), Jun. 17–20, 2004.
- [22] C. Onat, I. B. Kucukdemiral, S. Cetin, and I. Yuksek, "A comparison study of robust control strategies for automotive active suspension systems," in *Proc. International Symposium on Innovations in Intelligent Systems and Applications*, (Istanbul, Turkey), Jun. 15–18, 2005.

- [23] T. Ulu, G. Cansever, and I. B. Kucukdemiral, "An ANN based electronic glove for human-machine interaction," in *Proc. International Symposium on Innovations in Intelligent Systems and Applications*, (Istanbul, Turkey), Jun. 15–18, 2005.
- [24] I. B. Kucukdemiral and G. Cansever, "Formalization of a novel sugeno type adaptive fuzzy sliding mode controller for a class of nonlinear systems," in *Proc. IEEE International Conference on Mechatronics*, (Taiwan), Jul. 10–12, 2005.
- [25] A. Delibasi, I. B. Kucukdemiral, and G. Cansever, "A novel variable structure based adaptive control with disturbance estimation," in *Proc. 25th American Control Conference, ACC'06*, (Minneapolis, USA), Jun. 14–16, 2006.
- [26] C. Onat, I. B. Kucukdemiral, I. Yuksek, S. Sivrioglu, and G. Cansever, "Bir doğrusal olmayan süspansiyon sisteminin LPD modeli için \mathcal{H}_∞ tabanlı kontrolör tasarımı," in *Proc. (TOK'06) Turkish Automatic Control Assembly*, (Ankara, Turkey), Nov. 2006.
- [27] C. Onat and I. B. Kucukdemiral, "Aktif kütle sönümleyicili bir yapının yanal titreşimlerinin ilk modunu bastırarak \mathcal{H}_∞ kontrolcü tasarımı," in *Proc. (TOK'06) Turkish Automatic Control Assembly*, (Ankara, Turkey), Nov. 2006.
- [28] A. Delibasi, I. B. Kucukdemiral, and G. Cansever, "Yeni bir bozucu kestirimli, değişken yapılı, uyarlamalı kontrolcü," in *Proc.(TOK'06) Turkish Automatic Control Assembly*, (Ankara, Turkey), Nov. 2006.
- [29] A. Delibasi, I. B. Kucukdemiral, and G. Cansever, "LME yaklaşımıyla dayanıklı PID benzeri durum geri-besleme denetleyicisi: Çift eksenli sarkaç uygulaması," in *Proc.(TOK'07) Turkish Automatic Control Assembly*, (Ankara, Turkey), Sep. 2007.
- [30] L. Uzun and I. B. Kucukdemiral, "Genelleştirilmiş öngörülü kontrol algoritması ile Van De Vusse reaktör denetimi," in *Proc.(TOK'07) Turkish Automatic Control Assembly*, (Ankara, Turkey), Sep. 2007.
- [31] A. Delibasi, I. B. Kucukdemiral, and G. Cansever, "A robust PID like state-feedback control via LMI approach: An application on a double inverted pendulum system," in *IEEE Int. Symposium on Computational Intelligence in Robotics and Automation, CIRA 2007*, (Orlando, FL.), pp. 374–379, 20-23 June 2007.
- [32] A. Delibasi, I. B. Kucukdemiral, and G. Cansever, " L_2 , H_2 guaranteed-cost control of LPV systems with saturating actuators," in *16th Mediterranean Conference on Control and Automation, MED'08*, (Ajaccio, Corsica, France), June 2008.