

# Akın Delibaşı

ASSOCIATE PROFESSOR

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## Work Experience

### Yildiz Technical University

ASSOCIATE PROFESSOR OF CONTROL & AUTOMATION ENGINEERING

- Support the departmental committees
- Evaluate, monitor and mentor students
- Supervise research group
- Publish papers in journals through extensive research

*Istanbul, Turkey*

*April 2016 - PRESENT*

### Yildiz Technical University

ASSISTANT PROFESSOR OF CONTROL & AUTOMATION ENGINEERING

- Assess, review and evaluate student activities
- Prepare syllabi, tests, and quizzes
- Guide and mentor students in research projects
- Chair panels at professional conferences and present academic papers.

*Istanbul, Turkey*

*July 2010 - July 2017*

### Laboratoire d'analyse et d'architecture des systèmes - Centre national de la recherche scientifique (LAAS-CNRS)

POSTDOCTORAL RESEARCH FELLOW

- Supervisor: **Didier Henrion**
- Conduct research on polynomial matrix inequalities in robust control
- Construct a convex optimization problem to solve linear impulsive rendezvous problem for satellites

*Toulouse, France*

*March 2009 - September 2010*

### Yildiz Technical University

RESEARCH AND TEACHING ASSISTANT OF ELECTRICAL ENGINEERING

- Assist and support senior professors in their modules
- Dispersed, collected, and graded all assignments, including papers, quizzes, and tests.
- Supporting the conduct of Control and Digital Electronics Lab.
- Hardware modernization of robot arm in robotic laboratory and development an algorithm.

*Istanbul, Turkey*

*January 2002 - February 2009*

## Grants

### Development of Fixed-Order $H_\infty$ sub-Optimal Controller for Adaptive Optical Systems

*118E224 - TUBITAK - 1001*

PRINCIPLE INVESTIGATOR

*2018 - 2021*

- It was granted with the highest score A and top level budget 420.463TL (£77K)
- The aim of this project is to widen the bandwidth of free space laser communication system

### Design and Real-Time Implementation of Four-Rotor Unmanned Aerial Vehicles for Aggressive Maneuverability

*118M709 - TUBITAK - 1001*

RESEARCHER

*2018 - 2021*

- It was granted with the score B and the budget 282.799TL (£54K)
- My duties are optimal path planing and real time optimization

### Determination of Stability and Stability Conditions for Linear and Nonlinear Discrete Time Bi-Model Systems, Controler Design and Implementation

*117E188 - TUBITAK - 1001*

RESEARCHER

*2017 - 2020*

- It was granted with the score B and the budget 336.632TL (£75K)
- To find the optimal control law in the interval which switching takes place

### Reducing the Conservatism on the Design of Fixed Order $H_\infty$ Controller

*115E599 - TUBITAK - 3001*

PRINCIPLE INVESTIGATOR

*2015 - 2017*

- It was granted with the score A and the budget 88.450TL (£23K)
- Explicit closed-form expression for the computation of volume of the planar (2D) convex regions, using their support functions by the help of mixed volume theorem.

## Development and Optimal LPV control of an Active Suspension System Actuated by Linear Motors

108E089 - TUBITAK - 1001

RESEARCHER

2008 - 2011

- It was granted with the score B and the budget 284.643TL (£119K)

## Trajectory Tracking of Manutec r15 Robot Arm Using Artificial Neural Networks, Fuzzy Logic and Sliding Mode Control

Yildiz Technical University

RESEARCH FELLOW

2005 - 2007

## The Design of The Functional Path Maker Robot

Yildiz Technical University

RESEARCH FELLOW

2004 - 2004

## Technical Consultancy

### Brisa Bridgestone Tyre Research and Development Center (ARGESA)

[İstanbul, Turkey](#)

A STATISTICAL APPROACH TO ESTIMATE IRREGULAR TYRE WEAR

July 2019 - PRESENT

### Horizon Advanced Technologies

[İstanbul, Turkey](#)

DEVELOPMENT OF OPTIMAL TRAJECTORY PLANNING FOR INDUSTRIAL ROBOT MANIPULATOR

June 2019 - PRESENT

### Odine Solutions

[İstanbul, Turkey](#)

DEVELOPMENT OF DECISION SUPPORT MECHANISM IN WHOLESALE VOICE TRANSMISSION MANAGEMENT

December 2017 - PRESENT

### Datassist Payroll Services

[İstanbul, Turkey](#)

DEVELOP AN ALGORITHM TO IDENTIFY SALARY ANOMALIES USING STATISTICAL MACHINE LEARNING TECHNIQUES

September 2018 - PRESENT

### Dogus Kalip

[İstanbul, Turkey](#)

DEVELOPMENT OF THE PALLETIZER ROBOT SYSTEM - DORO

April 2016 - November 2016

### Verscom Solutions

[İstanbul, Turkey](#)

A FRAUD DETECTION APPROACH IN TELECOMMUNICATION USING K-MEAN CLUSTERING TECHNIQUE SWITH CENTRAL LIMIT THEORY

January 2015 - November 2017

### Vizyon Yazilimevi

[İstanbul, Turkey](#)

MULTI-OBJECTIVE OPTIMIZATION OF TOUR ROUTE ON THE TOURIST SATISFACTION USING GRAPH THEORY

August 2014 - January 2015

### Gentek Electronic

[İstanbul, Turkey](#)

SEMI-PAREMETRIC ESTIMATION OF THE DEGREENING TIME OF CITRUS FURITS

February 2014 - January 2015

### Eclipse Information Technology

[İstanbul, Turkey](#)

DEVELOP AN ALGORITHM TO SURVEY THE NATURAL GAS PIPELINE NETWORK

February 2014 - October 2014

### Teknosin Coding and Marking Systems

[İstanbul, Turkey](#)

FLEXIBILITY OF MARKING SYSTEMS WITHIN THE AUTOMATION SYSTEM

February 2013 - May 2013

### Bureau Veritas Lab. Turkey

[İstanbul, Turkey](#)

THE PRODUCTION OF VIBRATION TESTER AND DROP TESTER ( COMPLIES WITH ISTA 1A, 1B)

February 2005 - July 2005

### Unilever Turkey

[İstanbul, Turkey](#)

THE DEVELOPMENT OF HAIR PERFORMANCE TESTER APPARATUS

February 2004 - July 2004

## Education

### Yildiz Technical University

[İstanbul, Turkey](#)

PH.D. PROGRAM IN CONTROL AND AUTOMATION ENGINEERING, GPA: 3.84/4.0

October 2008

- Thesis Title: Robust Control of LPV Systems with Saturating Actuators
- Thesis Advisors: **Galip Cansever** and **İbrahim Beklan Küçükdemiral**

### Yildiz Technical University

[İstanbul, Turkey](#)

M.S. PROGRAM IN CONTROL AND AUTOMATION ENGINEERING, GPA: 3.38/4.0

February 2004

- Thesis Title: Modelling and Inverse Dynamic Control of 3-DOF Anthropomorphic Robot Manipulator
- Thesis Advisor: **Galip Cansever**

### Yildiz Technical University

[İstanbul, Turkey](#)

B.S IN ELECTRICAL ENGINEERING, GPA: 3.03/4.0

July 2001

- Senior Project Title: Three Phase AC Motor Control with Motorola MC68HC908MR32 MCU

## Module Taught

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XX: Year, A: Trimester A, B: Trimester B

### UNDERGRADUATE LEVEL:

<b>Automatic Control,</b>	11A, 14B, 16A
<b>Discrete Mathematics,</b>	11B,12B,13B,14B,15B,16B,17B
<b>Signals and Systems,</b>	12A, 13A, 14A, 15A, 16A, 17A, 18A
<b>Digital Systems (Electronics),</b>	12B,13B
<b>Electronics Lab.,</b>	12A, 13A

### GRADUATE LEVEL:

<b>Digital signal processor and their applications,</b>	11A, 12A
<b>System Theory,</b>	12B,13B,14B
<b>Linear Control System Design,</b>	14A, 15A, 15B, 16A, 16B, 17A, 17B, 18A

## Publications

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### THESIS

**A. Delibaşı, Robust Control of LPV Systems with Saturating Actuators, Ph.D. thesis, Oct. 2008**

**A. Delibaşı, Modelling and Inverse Dynamic Control of 3-DOF Anthropomorphic Robot Manipulator, M.S. thesis, Feb. 2004**

### JOURNAL PAPERS

**A. T. Koru, A. Delibaşı, H. Özbay, Dwell Time-Based Stabilisation of Switched Linear Delay Systems Using Clock-Dependent Lyapunov–Krasovskii Functionals, International Journal of Control, 1-11, 2018**

**B. Altiner, A. Delibaşı, B. Erol, Modeling and Control of Flexible Link Manipulators for Unmodeled Dynamics Effect, Proceedings of the Institution of Mechanical Engineers, Part I: Journal of Systems and Control Engineering, 233(3), 245-263, 2019**

**B. Erol, B. Altiner, E. Adalı, A. Delibaşı, H $\infty$  Suboptimal controller design for adaptive optic systems, Transactions of the Institute of Measurement and Control, 41(8), 2100-2113, 2019**

**B. Erol, A. Delibaşı, Fixed-order H $\infty$  Controller Design for MIMO Systems via Polynomial Approach, Transactions of the Institute of Measurement and Control, 41(7), 1985-1992, 2019**

**A. R. Yılmaz, B. Erol, A. Delibaşı, B. Erkmen, Design of Gain-Scheduling PID Controllers for Z-source Inverter Using Iterative Reduction-Based Heuristic Algorithms, Simulation Modelling Practice and Theory, 2019**

**A. T. Koru, A. Delibaşı, H. Özbay, Dwell Time-Based Stabilisation of Switched Delay Systems Using Free-Weighting Matrices, International Journal of Control, 91(1), 1-11, 2018**

**B. Erol, A. Delibaşı, PID type H $\infty$  Controller for Quarter Car Active Suspension System, Journal of Vibration and Control, 24(10), 1951 - 1966, 2018**

**A. G. Ak, G. Cansever, A. Delibaşı, Trajectory Tracking Control of an Industrial Robot Manipulator Using Fuzzy SMC with RBFNN, Gazi University Journal of Science, 28(1), 141 - 148, 2015**

**A. Delibaşı, Fixed-Order Robust Estimator Design for Side-Slip Angle of Vehicle, Mathematical Problems in Engineering, 2014**

**A. Delibaşı, I. B. Kucukdemiral, G. Cansever, L $_2$  Control of LPV Systems with Saturating Actuators: Pólya Approach, Optimal Control Applications and Methods, 34(1), 17 - 34, 2013**

**D. Arzelier, K. Z. Mounir, C. Louembet, A. Delibaşı, Using Polynomial Optimization to Solve the Fuel-Optimal Linear Impulsive Rendezvous Problem, Journal of Guidance, Control, and Dynamics, 34(5), 1567 - 1576, 2011**

**A. G. Ak, G. Cansever, A. Delibaşı, Robot Trajectory Tracking with Adaptive RBFNN-Based Fuzzy Sliding Mode Control, Information Technology and Control, 40(2), 151 - 156, 2011**

**A. Delibaşı, D. Henrion, Hermite Matrix in Lagrange Basis for Scaling Static Output Feedback Polynomial Matrix Inequalities, International Journal of Control, 83(12), 2494 - 2505, 2010**

**A. Delibaşı, E. Zergeroglu, I. B. Kucukdemiral, G. Cansever, Adaptive Self Tuning Control of Robot Manipulators with Periodic Disturbance, International Journal of Robotics and Automation, 25, 48 - 56, 2010**

### CONFERENCE PAPERS

**O. Yılmaz, B. Erol, A. Delibaşı, A Comparative Study of Model Reduction Techniques for Specified Bandwidth on Aircraft, 21st IFAC Symposium on Automatic Control in Aerospace - ACA 2019, Cranfield, UK, 2019**

**A. Kurtiş, B. Altiner, A. Delibaşı, Robust PID Design for Euler Bernoulli Beam, 21st IFAC Symposium on Automatic Control in Aerospace - ACA 2019, Cranfield, UK, 2019**

- A. T. Koru, A. Delibaşı, H. Özbay, On Dwell Time Minimization for Switched Delay Systems: Time-Scheduled Lyapunov Functions**, *IFAC-PapersOnLine*, 49(10), 37 - 40, 2016
- B. Erol, A. Delibaşı, Fixed order  $H_\infty$  Controller for Quarter Car Active Suspension System**, *23rd Mediterranean Conference on Control and Automation (MED)*, 921 - 926, 2015
- A. T. Koru, A. Delibaşı, H. Özbay, On Dwell Time Minimization for Switched Delay Systems: Free-Weighting Matrices Method**, *53rd IEEE Conference on Decision and Control, 1978 - 1982, Los Angeles, 2014*
- L. Ucu, I. B. Kucukdemir, A. Delibaşı, G. Cansever, LPV Control Active Suspension System**, *IEEE International Conference on Mechatronics*, 116 - 121, Istanbul, 2011
- I. B. Kucukdemir, L. Ucu, Y. Eren, H. Gorgun, A. Delibaşı, G. Cansever, LPV Control of Actuator Saturated Systems: A Case Study on Single-Track Vehicle Control**, *IFAC Proceedings Volumes*, 43(18), 589 - 594, Istanbul, 2010
- K. Z. Mounir, D. Arzelier, A. Delibaşı, C. Louembet, Polynomial Optimization for the Solution of Fuel-Optimal Impulsive Rendezvous Using Primer Vector Theory**, *49th IEEE Conference on Decision and Control (CDC)*, 352 - 357, 2010
- A. Delibaşı, I. B. Kucukdemir, G. Cansever,  $L_2, H_2$  Guaranteed-Cost Control of LPV Systems with Saturating Actuators**, *16th Mediterranean Conference on Control and Automation*, 152 - 157, Ajaccio, 2008
- A. Delibaşı, I. B. Kucukdemir, G. Cansever, A robust PID Like State-Feedback Control via LMI Approach: An Application on a Double Inverted Pendulum System**, *International Symposium on Computational Intelligence in Robotics and Automation*, 374 - 379, Jacksonville, 2007
- A. Delibaşı, I. B. Kucukdemir, G. Cansever, A Novel Variable Structure Based Adaptive Control with Disturbance Estimation**, *2006 American Control Conference, Minneapolis, 2006*
- A. Delibaşı, T. Turker, G. Cansever, Realtime DC Motor Position Control by Fuzzy Logic and PID Controllers Using Labview**, *Proceedings of the IEEE International Conference on Mechatronics and Robotics, Aachen, 2004*

## Administrative

2017 - PRESENT	<b>Associate Dean</b> , School of Electrical-Electronics Engineering	<a href="#">Yildiz Technical University</a>
2016 - 2017	<b>Vice Chairman</b> , Department of Control and Automation Engineering	<a href="#">Yildiz Technical University</a>
2016 - PRESENT	<b>Chair of Academic Evaluation and Quality Development</b> , School of Electrical-Electronics Engineering	<a href="#">Yildiz Technical University</a>
2016 - PRESENT	<b>Member</b> , University Education Board	<a href="#">Yildiz Technical University</a>
2015 - PRESENT	<b>Member</b> , The Industrial Relations Commission of Department of Control and Automation	<a href="#">Yildiz Technical University</a>

## Thesis Supervision

### MS THESIS

Mar. 2017	<b>Erkan Adalı</b> , Development of $H_\infty$ Controller for Adaptive Optical Systems	<a href="#">Yildiz Technical University</a>
Jan. 2017	<b>İhsan Berk Altınır</b> , Modelling and Control of Single Flexible Link Manipulator	<a href="#">Yildiz Technical University</a>
Mar. 2015	<b>Bilal Erol</b> , Quarter Car Active Suspension System Identification and Control	<a href="#">Yildiz Technical University</a>
Apr. 2014	<b>Canalp Belgütay</b> , $H_\infty$ Control and Mathematical Modeling of a Quarter-Car System via Non-Parametric Approach	<a href="#">Yildiz Technical University</a>
May. 2013	<b>Gökhan Akça</b> , A Robust PD Controller Design	<a href="#">Yildiz Technical University</a>

### ONGOING MS THESIS

Feb. 2019	<b>Mustafa Fatih Macit</b> , Robust Controller Design for Ballbot	<a href="#">Yildiz Technical University</a>
Oct. 2018	<b>Atahan Kurtti Ői</b> , Optimal Path Planning	<a href="#">Yildiz Technical University</a>
Sep. 2018	<b>Fatih Oynak</b> , Obstacle Avoidance for a Mobile Robot	<a href="#">Yildiz Technical University</a>
Feb. 2018	<b>Reha Özgür ŐimŐek</b> , Optimal Route Planning for a Mobile Robot	<a href="#">Yildiz Technical University</a>
Sep. 2017	<b>Uğur Madralı</b> , Wavefront Estimation for Adaptive Optics Systems	<a href="#">Yildiz Technical University</a>
Sep. 2017	<b>Burak Pehlivan</b> , Active Vibration Control for Aircrafts	<a href="#">Yildiz Technical University</a>

### PHD THESIS

Feb. 2017	<b>Ahmet Taha Koru</b> , Dwell Time Minimization of Switched Delay Systems	<a href="#">Yildiz Technical University</a>
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### ONGOING PHD THESIS

Jul. 2017	<b>İhsan Berk Altiner</b> , PDE Controller Design for Active Vibration Systems	<i>Yildiz Technical University</i>
Aug. 2016	<b>Bilal Erol</b> , Development of Fixed-Order $H_{\infty}$ sub-Optimal Controller for Adaptive Optical Systems	<i>Yildiz Technical University</i>

## Student Satisfaction Survey Results (Last 4 years)

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<b>Automatic Control</b>	6.27/7.00(15S), 6.02/7.00(16F)
<b>Discrete Mathematics</b>	6.31/7.00(14S), 6.24/7.00(15S), 6.45/7.00(16S), 6.07/7.00(17S)
<b>Signals and Systems</b>	6.38/7.00(15F), 6.09/7.00(16F), 6.13/7.00(17F), 6.57/7.00(18F)
<b>Linear Control Sys. Design</b>	4.58/5.00(14F), 4.41/5.00(15F), 4.48/5.00(15S), 4.36/5.00(16F), 4.66/5.00 (16S), 4.49/5.00 (17F), 4.6/5.00 (17S), 4.44/5.00 (18F)

## Awards

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2009	<b>Postdoctoral Fellowship</b> , The Scientific and Technological Research Council of Turkey	<i>Ankara, Turkey</i>
2005	<b>Technical Advisor, 3rd Prize</b> , XPLORE New-Automation Award	<i>Germany</i>
2004	<b>Technical Advisor of Startech, 3rd Prize</b> , ABU Robocon Robot Contest Turkey Selection	<i>Ankara, Turkey</i>
2001	<b>2rd Prize</b> , Motorola Semiconductor Products Sector Flash Microcontroller Design Contest	<i>İstanbul, Turkey</i>

## Organization

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2018	<b>Program Chair</b> , 6th International Conference on Control Engineering & Information Technology	<i>İstanbul, Turkey</i>
2017	<b>Technical Associate Editor</b> , IFAC 20th World Congress	<i>Toulouse, France</i>
2017	<b>Organizing Committee Member</b> , TOK2017, National Conference on Automatic Control	<i>İstanbul, Turkey</i>
2014	<b>National Program Committee Member</b> , TOK2014, National Conference on Automatic Control	<i>Kocaeli, Turkey</i>
2013	<b>National Program Committee Member</b> , TOK2013, National Conference on Automatic Control	<i>Malatya, Turkey</i>
2009	<b>Organizing Committee Member</b> , TOK2009, National Conference on Automatic Control	<i>İstanbul, Turkey</i>

## Memberships

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- IFAC Technical Committee Member (2.5) on Robust Control
- IFAC Technical Committee Member (2.2) on Linear Control Systems
- IFAC Technical Committee Member (2.6) on Distributed Parameter Systems
- TOK, Member, National Organization on Automatic Control