Ali Nail İNAL

Contact Information

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Research Interests

Dynamically dexterous robot behaviors, analysis and control of underactuated systems, Dynamical modeling and physically realistic simulations, motion control and planning, feedback control systems, balancing robots

Education

Bilkent University, Bilkent, Ankara, TURKEY

Ph.D., Electrical and Electronics Engineering, September 2012 to Present

- Ph.D. Candidate
- Adviser: Prof. Dr. Ömer MORGÜL
- Adviser: Assoc. Prof. Dr. Uluç SARANLI
- Area of Study: Control Engineering, Robotics
- CGPA: 3.57/4.00

M.S., Electrical and Electronics Engineering, August 2012

- Thesis Topic: *3D Dynamic Modeling of a Spherical Wheeled Self-Balancing Mobile Robot*
- Adviser: Prof. Dr. Ömer MORGÜL
- Adviser: Assoc. Prof. Dr. Uluç SARANLI
- Area of Study: Control Engineering, Robotics
- CGPA: 3.50/4.00

B.S., Electrical and Electronics Engineering, June 2009

- CGPA: 3.75/4.00

Academic and Professional Experience

Bilkent University, Bilkent, Ankara, TURKEY

Research Assistant **September 2009 to present**

Teaching Assistant **September 2009 to present**

- EEE 202: Circuit Theory (Spring 2014)
  - Teaching & Lab assistance and grading
- EEE 542: Nonlinear Systems (Fall 2014)
  - Teaching assistance and grading
- EEE 545: Sampled Data Systems (Fall 2013)
  - Teaching assistance and grading
- EEE 211: Analog Electronics (Spring 2011,2012)
  - Lab assistance and grading lab reports
- MATH 242: Engineering Mathematics II (Fall 2012, Spring 2013)
  - Teaching assistance and grading
- EEE 342: Feedback Control Systems (Spring 2010, Fall 2014)
  - Teaching & Lab assistance and grading
- EEE 313: Electronic Circuit Design (Spring 2010,2011)
  - Lab assistance and grading

Senior Project **Fall 2008**

- Research Topic: *Investigation of effects of cooperation in wireless localization systems*
- Supervisor: Asst. Prof. Dr. Sinan Gezici
  - Investigated effects of cooperation between nodes on position estimation of a target node by implementing nonlinear least-squares estimator.

- Performed simulations for various scenarios of line-of-sight (LOS) and non-line-of-sight (NLOS) cases of cooperating nodes.
- Also derived the Cramer-Rao lower bounds on position estimation.

ASELSAN Inc., Ankara, TURKEY

Part-time Engineer **January 2009 - June 2009**

- Worked at *Unmanned Systems Department* of Defense SystemsTechnologies Division of company 1.5 day per week
- Implemented a GPS sensor for systems
- Prepared a motor parameter calculator interface

Internship **June 2008 - July 2008**

- Worked at Defense SystemsTechnologies Division
- Designed and Implemented a depth map extractor for a stereo camera, and its interface in Matlab

Publications

İnal, A.N.; Ö. Morgül; and U. Saranlı;, "3D Dynamic Modeling of a Spherical Wheeled Self-Balancing Mobile Robot", *Intelligent Robots and Systems (IROS), 2012 IEEE/RSJ International Conference on*, vol., no., pp.5381-5386, 7-12 Oct. 2012, doi: 10.1109/IROS.2012.6385689

İnal, A.N. *3D Dynamic Modeling of a Spherical Wheeled Self-Balancing Mobile Robot* M.S. Thesis, August 2012, Bilkent University,Ankara, Turkey

Honours, Awards and Fellowships

High Honour List at Bilkent University in all eight semesters 2005-2009
Awarded with Merit Scholarship for undergraduate study from Bilkent University, 2006-2009.
Awarded with Full Scholarship for M.S. study from Bilkent University, 2009.
Awarded with Turkish Scientific and Research Council Scholarship for M.S. study, 2009.
Awarded with Turkish Scientific and Research Council Scholarship for Ph.D. study, 2012.

Professional Memberships

IEEE Student Member, (2012-present)

IEEE Robotics and Automation Society Member (2012-present)

Bilkent Dexterous Robotics and Locomotion Group(2009)

Computer and Programming Skills

MATLAB, Mathematica, Java, VHDL, C, Assembly, Pspice, Proteus (and similar design programs), Solidworks, MS-Office & simialr office products, Microsoft Windows OS family, Linux(user level), LaTeX

Related Coursework

Linear System Theory, Robust Feedback Theory, Embedded Systems, Nonlinear Systems, Robot Motion Control and Planning, Digital Signal Processing, Computer Networks, Random Processes, Advanced Signal Processing, Introduction to Robotics, Dynamics, Sampled Data Systems, Detection and Estimation Theory, Pattern Recognition, Neural Networks, Biomedical Signals and Instrumentation, Mathematical Programming, Statistical Technique in Mobile Robotics, Control and Optimization of Stochastic Systems

Language Skills

Turkish (native), English (advanced, TOEFL 2011: 103/120), German (basic), French (intro).

Other Activities and Projects

- Member of Engineering Association at Bilkent University, 2005.
- Builded and tested an analog transceiver operating at amateur band, 2006.
- Bilkent University, Engineering Association, Personal Development Certificate, 2006.
- Member of Robotic Society of Bilkent, 2007

- Designed and implemented a Web-Cache Application using Java, 2008.
- Designed and implemented a parallel downloading agent using Java, 2008.
- Designed and implemented a basic mapper mobile robot, 2009
- Group Advisor for some of the Summer of Robotics Projects at **Bilkent Dexterous Robotics and Locomotion Group**,(Summer 2011)
- Designed and implemented a handwritten character recognition system with neural networks and SVM using Matlab, 2012.
- Designed and implemented a Heart Rate Variability analyser to observe Real Heart inputs using Matlab, and made a working prototype hardware based on Ardunio to work online with a Matlab GUI, 2013.
- Designed and implemented Scan-matching and grid-based FastSLAM for laser range scanner in Matlab, 2013.
- Part of the design process for the renovation of the Feedback Control Course labs at undergraduate level, which aims to use Simulink on embedded targets (Arduino in this case) to prepare hardware based lab assignments, 2013-2014.