

KAMRAN TURKOGLU

One Washington Square
Aerospace Engineering Department
San Jose State University
San Jose, CA 95192

Phone: +1 (408) 924-4329
Email: kamran.turkoglu@sjsu.edu
<http://www.engr.sjsu.edu/kamran/>
(Permanent resident - green card holder)

APPOINTMENTS

San Jose State University
Assistant Professor in Aerospace Engineering

San Jose, CA, USA
August, 2013 - present

EDUCATION

DEGREES

University of Minnesota Ph.D. in Control Science & Dynamical Systems { <i>Major degree</i> } Aerospace Engineering & Mechanics { <i>Minor degree</i> }	Minneapolis, MN, USA <i>August, 2012</i>
Istanbul Technical University (I.T.U.) M.Sc. in Aerospace & Aeronautical Engineering	Istanbul, TURKEY <i>June 2007</i>
Istanbul Technical University (I.T.U.) B.Sc. in Aeronautical Engineering	Istanbul, TURKEY <i>June 2006</i>
Istanbul Technical University (I.T.U.) B.Sc. in Aerospace Engineering	Istanbul, TURKEY <i>June 2005</i>

DOCTORAL DISSERTATION

Title: "Real-time strategies for enhancing aircraft performance in Wind"
Adviser: Prof. Yiyuan J. Zhao
Co-Adviser: Prof. Tryphon T. Georgiou

The thesis develops an analytical framework for the design of real-time optimal flight control and guidance strategies by utilizing wind energy through in-situ and local wind velocity measurements, which improves aircraft performance, minimizes fuel consumption and maximizes endurance.

RESEARCH INTERESTS

Real-Time Nonlinear Control/Optimization Algorithms for Complex Systems (network topologies, mechanical/dynamical systems, systems biology, aerospace ...), Control Theory, Autonomous Flight Control Systems (with emphasis on UAVs, quad copters and unmanned flights), Spacecraft Control, Orbital Mission Design and Autonomous Rendezvous problems. I also pursue research on Multi-Variable Robust Control Design Techniques (such as H_∞ , μ -synthesis), Convex Optimization, Active Vibration & Control and Stability Analysis of Dynamic Systems with Inherited Time-Delays.

ACADEMIC & PROFESSIONAL HONORS

- NASA Summer Research Fellow, NASA Ames Research Center, AFDD Flight Control Directorate, Moffett Field, CA, 2014
- *Outstanding Teaching Assistant Award*, College of Science and Engineering Student Board, University of Minnesota, 2011.
- Control Science & Dynamical Systems Department Fellowship Award, 2009.
- Aerospace Engineering Department Summer Scholarship Award, 2009-2010.
- Scientific and Technological Research Council of Turkey Fellowship Award, 2006-2007.
- *The Best Student Paper Award* in 2nd WSEAS International Conference on Dynamical Systems and Control, Bucharest, Romania, 2006.
- Graduated with First Class Honour and Ranked 1st (first) in Department of Aerospace Engineering, Istanbul Technical University (I.T.U.), 2005.
- Ranked in the top %1 among graduated 5890 students from Istanbul Technical University, 2005.

RESEARCH EXPERIENCE

- **Research Fellow, NASA Ames Research Center, AFDD Flight Control Directorate, Moffett Field, CA, USA**, (Jun 2014 - Aug 2014)
- **Assistant Professor, San José State University, San Jose, CA, USA**, (Aug 2013 - present)
- **Research Assistant**,
 - **University of Minnesota**, (Sep 2008 - August 2012).
 - **University of Connecticut**, (Aug 2007 - May 2008).
 - **Istanbul Technical University, Turkey**, (Sep 2003 - Jun 2007).
- **Research Intern**
 - **Seagate Technology, Shakopee, MN, USA**, (Jun - Jul. 2012).
 - **Seagate Technology, Shakopee, MN, USA**, (May - Nov. 2011).
 - **ETH Zuerich, Switzerland, with Prof. Manfred Morari**, (Jun - Aug 2005).
 - **University of Strathclyde, Scotland, with Prof. Michael J. Grimble**, (Jun - Jul 2004).
 - **University of Seville, Spain, with Prof. Carlos Vivas Venegas**, (Jun - Jul 2003).

GRANTS & CONTRACTS

- “Real-Time Estimation Algorithms for Nonlinear Systems”, *National Science Foundation (NSF) CMMI Sensors, Dynamics and Control*, PI, 2015, \$299,713 (*decision pending*)
- “NSF EAGER: Air Traffic Management and Collision Avoidance Strategies for Commercial Use of Quad-Copters”, *National Science Foundation (NSF) CMMI Sensors, Dynamics and Control*, PI, 2015, \$298,268 (*decision pending*)
- “ONR Young Investigator Program; Shaping the Future of Flight: Nature Inspired Real-Time Guidance Strategies by Utilization of Wind Energy”, *Office of Naval Research (ONR) Young Investigator Program*, PI, 2015, \$503,355 (*decision pending*)
- “NSF MRI: Acquisition of Hybrid CPU/GPU High-Performance Computing and Storage for Multidisciplinary Research and Teaching at San Jose State University”, *National Science Foundation (NSF) Major Research Instrumentation*, Co-PI, 2014, \$927,960 (*decision pending*)

- “Autonomous Flight, Future Vertical Lift Systems, and Human System Integration”. *NASA Ames Research Center, AFDD Flight Control Systems Directorate and San Jose State Research Foundation, NASA Cooperative agreement NNX13AI30A*, Co-PI, June 16 - Aug 28, 2014, \$42,543
- “Scientific Experiment and Research Education Development Grant”, San Jose State University, Provosts Office, PI, Apr 12, 2014, \$25,000.
- “Flight Control Systems (FCS) and Control Science & Dynamic Systems (CSDy) Laboratory Development Grant”, San Jose State University, Charles W. Davidson College of Engineering, PI, Nov 10, 2013, \$30,000.
- “Low-Cost Spacecraft Attitude Control System Experimental Set-up Development”, Space Systems Lorall (SSL-MDA), PI, Dec 10, 2013, \$2,000.
- “Laboratory and Research Development Grant”, San Jose State University, Office of Provost, PI, Apr 12, 2014, \$5,000.

PUBLICATIONS

Book Chapters

1. **Kamran Turkoglu** and Nejat Olgac, “Robust Control for Multiple Time Delay MIMO Systems with Delay-Decouplability Concept”, *Topics in Time Delay Systems, Lecture Notes in Control and Information Sciences*, Vol 388/2009, pp.37-47, Springer-Verlag, 2009.

Journal Papers

1. Fei Sun and **Kamran Turkoglu**, “Real-Time Non-Linear Receding Horizon Control Methodology for Estimation of Time-Varying Parameters”, *Optimal Control Applications and Methods, (under review)*, 2015
2. Fei Sun and **Kamran Turkoglu**, “Novel Real-Time Non-Linear Estimation Strategies in Chaotic Environments”, *Nonlinear Dynamics, (under review)*, 2014
3. **Kamran Turkoglu**, “Real-Time Second-Order Optimal Guidance Strategies for Optimizing Aircraft Performance in Stochastic Wind Conditions”, *Aerospace Science and Technology, (under review)* 2014
4. **Kamran Turkoglu**, “First-Order Real-Time Guidance Strategies for UAVs by Utilization of Wind Energy”, *AIAA Journal of Aircraft, (under review)* 2014
5. **Kamran Turkoglu**, Ugur Ozdemir, Melike Nikbay, and Elbrous M. Jafarov, “PID Parameter Optimization of an UAV Longitudinal Flight Control System”, *International Journal of Mechanical, Aerospace, Industrial and Mechatronics Engineering* Vol:2 No:9, 2008
6. **Kamran Turkoglu** and Elbrous M. Jafarov, “Application of H inf. Loop Shaping Robust Control System Design on Longitudinal Dynamics of Hezarfen UAV with Classical PI(D) and Pole Placement Methods: A Comparison Analysis - (S/T)”, *WSEAS Transactions on Systems*, Issue 1, Vol. 6, (pp.206-213), Jan. 2007 .
7. **Kamran Turkoglu** and Elbrous M. Jafarov, “Lateral Robust Control System Design of Hezarfen UAV via H inf. Loop Shaping Approach and Sensitivity / Co-Sensitivity Analysis”, *WSEAS Transactions on Systems*, Issue 9, Vol. 5, (pp.2040-2047), Sep. 2006.

Conference Papers

1. Gong, A. and **Turkoglu, K.**, “Preliminary Design and Prototyping of a Low-Cost Spacecraft Attitude Determination and Control Setup System Identification”, *Aerospace Control and Guidance Systems Committee Meeting*, March 04-06, Portland, OR 2015
2. Lu, L. and **Turkoglu, K.**, “Utilization of Differential Thrust for Directional Stability with a Damaged Vertical Stabilizer”, (*accepted for publication in*) *IEEE Aerospace Conference*, Mar. 7-14, 2015

3. Somavarapu, D., **Turkoglu, K.**, Mazzulla, A., Fritz, S., Pirkl, Z. and Carlozzi, A. "Sample-Return Mission Planning for an Asteroid on an Earth Fly-By Trajectory", (*accepted for publication in*) IEEE Aerospace Conference, Mar. 7-14, 2015
4. Gong, A. and **Turkoglu, K.**, "Preliminary Design and Prototyping of a Low-Cost Spacecraft Attitude Determination and Control Setup", AIAA Guidance, Navigation, and Control Conference, AIAA Science and Technology Forum 2015, Jan. 5-9, 2015 .
5. Ji, A. and **Turkoglu, K.**, "Development of a Low-Cost Experimental Quadcopter Testbed using an Arduino controller for Video Surveillance", AIAA Infotech @ Aerospace, AIAA Science and Technology Forum 2015, Jan. 5-9, 2015 .
6. Mazzulla, A. and **Turkoglu, K.**, "Utilization of Wind Energy in Optimal Guidance Strategies via Real-Time Control Methodologies", AIAA Infotech @ Aerospace, AIAA Science and Technology Forum 2015, Jan. 5-9, 2015 .
7. Najafi, S. and **Turkoglu, K.**, "Conceptual Study and Prototype Design of a Subsonic Transport UAV with VTOL Capabilities", 53rd AIAA Aerospace Sciences Meeting, AIAA Science and Technology Forum 2015, Jan. 5-9, 2015 .
8. **Kamran Turkoglu**, "Real-Time Guidance Strategies for Optimizing Aircraft Performance in Stochastic Wind Conditions", 2014 American Control Conference (ACC) at the Portland, Oregon, June 04-06, 2014.
9. **Kamran Turkoglu**, "Short-Term Turning in Presence of Wind as a Trajectory Optimization Problem", Fourth 2014 IEEE Aerospace Conference, Yellowstone Conference Center, Big Sky, Montana, March 01 - 08, 2014.
10. **Kamran Turkoglu**, "Statistics Based Modeling of Wind Speed and Wind Direction in Real Time Optimal Guidance Strategies via Ornstein-Uhlenbeck Stochastic Processes", Fourth Aviation, Range, and Aerospace Meteorology Special Symposium, American Meteorological Society (AMS) 94th Annual Meeting, 2-6 February 2014, Atlanta, GA.
11. **Kamran Turkoglu**, Yiyuan J. Zhao, and Brian Capozzi, "Real-Time Insitu Strategies for Enhancing UAV Endurance by Utilizing Wind Energy", *AIAA Guidance, Navigation, and Control Conference*, 10 - 13 August 2009, Chicago, Illinois, USA, AIAA 2009-5910.
12. **Kamran Turkoglu** and Nejat Olgac, "Robust Control for Multiple Time Delay Systems with Delay - Decouplability Concept", *DSCC 2008, ASME 2008 Dynamic Systems and Control Conference*, October 20-22, 2008, Ann Arbor, Michigan, USA, 2008-00167.
13. **Kamran Turkoglu** and Elbrous M. Jafarov, "Augmented optimal LQR control system design as an application on the longitudinal flight dynamics of an UAV: Inner and outer loop concepts", *9th WSEAS International Conference on Automatic Control, Modeling & Simulation*, Istanbul, Turkey, May 27-29, 2007 (pp.100-105).
14. **Kamran Turkoglu** and Elbrous M. Jafarov, "H inf. Loop Shaping Robust Control vs. Classical PI(D) Control: A case study on the Longitudinal Dynamics of Hezarfen UAV", *2nd WSEAS International Conference on Dynamical Systems and Control*, Bucharest, Romania, October 16-17, 2006, (pp.105-110), **Recipient of "The Best Student Paper Award"**.
15. **Kamran Turkoglu** and Elbrous M. Jafarov, "Lateral Dynamic Modeling of an Unmanned Aerial Vehicle (UAV) and H inf. Loop Shaping Robust Control System Design", *10th WSEAS International Conference on SYSTEMS*, Vouliagmeni, Athens, Greece, July 10-12, 2006 (pp.369-374)
16. **Kamran Turkoglu** and Elbrous M. Jafarov, "Lateral Flight Model of Hezarfen UAV and Automatic Control System Design via Classical Root-Locus Method: Inner and Outer Loop Approaches" (*in Turkish*), *1st National Conference on Aeronautics and Aerospace Technologies*, September 21-23, 2006, METU, Ankara, Turkey. (UHUK-2006-023)

FORTHCOMING PAPERS

1. **Kamran Turkoglu** and Fei Sun, Real-Time Non-Linear Estimation Methodologies in Systems Biology, (to be submitted for BMC Systems Biology), 2014.
2. Gong, A. and **Turkoglu, K.**, “Preliminary Design and Prototyping of a Low-Cost Spacecraft Attitude Determination and Control Setup”, (*in preparation*) for *AIAA Journal of Guidance, Control & Dynamics*, (*in preparation*) 2014.
3. Ji, A. and **Turkoglu, K.**, “Development of a Low-Cost Experimental Quadcopter Testbed using an Arduino controller for Video Surveillance”, (*in preparation*) for Elsevier Aerospace Science and Technology, 2014.
4. Mazzulla, A. and **Turkoglu, K.**, “Utilization of Wind Energy in Optimal Guidance Strategies via Real-Time Control Methodologies”, (*in preparation*) for Journal of Dynamical and Control Systems, 2014.
5. Najafi, S. and **Turkoglu, K.**, “Conceptual Study and Prototype Design of a Subsonic Transport UAV with VTOL Capabilities”, (*in preparation*) for AIAA Journal of Aircraft, 2014.

TEACHING and CURRICULUM DEVELOPMENT

Teaching:

- **Instructor, AE 200 - Engineering Analysis & Control of Aerospace Systems (Graduate)**, San Jose State University, CA USA (*Fall 2014*)
- **Instructor, AE 247 - Trajectory Optimization (Graduate)**, San Jose State University, CA USA (*Fall 2014*)
- **Instructor, AE 242 - Orbital Mechanics and Mission Design (Graduate)**, San Jose State University, CA USA (*Spring 2014*)
- **Instructor, AE 245 - Spacecraft Dynamics and Control (Graduate)**, San Jose State University, CA USA (*Spring 2014*)
- **Instructor, AE 246 - Advanced Aircraft Stability and Control (Graduate)**, San Jose State University, CA USA
 - Fall 2013
 - Spring 2015
- **Instructor, AE 168 - Aerospace Vehicle Dynamics and Control (Undergraduate)**, San Jose State University, CA USA (*Fall 2013*)
- **Instructor, AE 157 - Automatic Control System Design for Aerospace Systems (Undergraduate)**, San Jose State University, CA USA (*Spring 2015*)
- **Teaching Assistant, AEM 2012 - Dynamics (Undergraduate)**, with Prof. Demoz Gebre-Egziabher, Prof. Yohannes Ketema, Dr. Todd Hesla, Prof. Bernie Mettler, University of Minnesota, MN, USA
 - Fall 2009,
 - Summer 2010,
 - Fall 2010,
 - Spring 2011 (**Recipient of Outstanding TA Award**) .
- **Teaching Assistant, AEM 3031 - Deformable Body Mechanics (Undergraduate)**, with Prof. Roger Fosdick, Prof. Yohannes Ketema, University of Minnesota, MN, USA.
 - Fall 2008,

- Summer 2009,
- Spring 2010
- **Teaching Assistant, AEM 4301 - Orbital Mechanics (Undergraduate)**, with Prof. Demoz Gebre-Egziabher, University of Minnesota, MN, USA. (*Spring 2008*)
- **Teaching Assistant, AEM 4602W - Aeromechanics Laboratory (Undergraduate)**, with Prof. Thomas Shield, University of Minnesota, MN, USA. (*Spring 2009*)
- **Teaching Assistant, AEM 4331 - Aerospace Vehicle Design (Undergraduate)**, University of Minnesota, MN, USA. (*Spring 2009*)
- **Mentor, International Teaching Assistant Orientation Program**, with Mrs. Mary V. Jetter, Mrs. Elena Stetsenko, University of Minnesota, MN, USA.
 - Summer 2009,
 - Summer 2010,
- **Teaching Assistant, ME 251 - Linear Control System Design**, with Prof. Nejat Olgac, University of Connecticut, CT, USA. (*Fall 2007*)

Curriculum Development:

- **AE 200 - Engineering Analysis & Control of Aerospace Systems (Graduate)**, San Jose State University, CA USA
- **AE 247 - Trajectory Optimization (Graduate)**, San Jose State University, CA USA
- **AE 242 - Orbital Mechanics and Mission Design (Graduate)**, San Jose State University, CA USA
- **AE 245 - Spacecraft Dynamics and Control (Graduate)**, San Jose State University, CA USA
- **AE 246 - Advanced Aircraft Stability and Control (Graduate)**, San Jose State University, CA USA
- **AE 168 - Aerospace Vehicle Dynamics and Control (Undergraduate)**, San Jose State University, CA USA
- **AE 157 - Automatic Control (Undergraduate)**, San Jose State University, CA USA

WORK EXPERIENCE

- **Senior Research & Development Servo Control Engineer, Hitachi Global Storage Technology (HGST), a Western Digital Company** Sep. 2012 - Jul. 2013
Company specialized on hard disk drives. Main task is to come up with new robust, optimal multi-variable controller designs to improve performance on vibration induced environments.
- **Summer Research Intern, Seagate Technology**
Company specialized on hard disk drives. Main task is to come up with new controller designs to improve performance.
 - Jun. - Jul. 2012.
 - May - Nov. 2011
- **Summer Intern, Turkish Aerospace Industry (TAI)**, Jun. - Jul. 2004.
Analyzed the performance of an existing UAV and designed robust controller techniques to improve flight performance

TALKS

Academic/Lecture/Seminar Talks

1. “Real-Time Guidance Strategies for Optimizing Aircraft Performance in Stochastic Wind Conditions”, 2014 American Control Conference (ACC) at the Portland, Oregon, June 04-06, 2014.
2. “Short-Term Turning in Presence of Wind as a Trajectory Optimization Problem”, Fourth 2014 IEEE Aerospace Conference, Yellowstone Conference Center, Big Sky, Montana, March 01 - 08, 2014.
3. “Statistics Based Modeling of Wind Speed and Wind Direction in Real Time Optimal Guidance Strategies via Ornstein-Uhlenbeck Stochastic Processes”, Fourth Aviation, Range, and Aerospace Meteorology Special Symposium, American Meteorological Society (AMS) 94th Annual Meeting, 2-6 February 2014, Atlanta, GA.
4. “Real-Time Insitu Strategies for Enhancing UAV Endurance by Utilizing Wind Energy”, *AIAA Guidance, Navigation, and Control Conference*, 10 - 13 August 2009, Chicago, Illinois, USA.
5. “Robust Control for Multiple Time Delay Systems with Delay - Decouplability Concept”, *DSCC 2008, ASME 2008 Dynamic Systems and Control Conference*, October 20-22, 2008, Ann Arbor, Michigan, USA, 2008-00167.
6. “Augmented optimal LQR control system design as an application on the longitudinal flight dynamics of an UAV: Inner and outer loop concepts”, *9th WSEAS International Conference on Automatic Control, Modeling & Simulation*, Istanbul, Turkey, May 27-29, 2007.
7. “H inf. Loop Shaping Robust Control vs. Classical PI(D) Control: A case study on the Longitudinal Dynamics of Hezarfen UAV”, *2nd WSEAS International Conference on Dynamical Systems and Control*, Bucharest, Romania, October 16-17, 2006, **Recipient of “The Best Student Paper Award”**.
8. “Lateral Dynamic Modeling of an Unmanned Aerial Vehicle (UAV) and H inf. Loop Shaping Robust Control System Design”, *10th WSEAS International Conference on SYSTEMS*, Vouliagmeni, Athens, Greece, July 10-12, 2006
9. “Lateral Flight Model of Hezarfen UAV and Automatic Control System Design via Classical Root-Locus Method: Inner and Outer Loop Approaches” (*in Turkish*), *1st National Conference on Aeronautics and Aerospace Technologies*, September 21-23, 2006, METU, Ankara, Turkey.

Industry/Other Talks

1. (*various venues*) “Real-time guidance strategies for enhancing aircraft performance in presence of winds”,
 - (*Invited*) NASA Ames Research Center, Intelligent Systems Group, Moffett Field, CA - January 2014.
 - (*Invited*) San José State University, San Jose, CA - April 2013.
 - (*Invited*) Hitachi Global Storage Technology (HGST) San Jose, CA - Jun 2012.
 - (*Invited*) Seagate Technology, Shakopee, MN - Jan. 2011.
 - Dept. of Aerospace Eng. and Mechanics Control Seminar, University of Minnesota, MN - Oct. 2010.
2. “Robust Control applications, System Identification and Adaptive filtering techniques on HDDs”, Seagate Technology (Internal Seminar), Shakopee, MN - Oct. 2011.
3. “Robustness, disturbance rejection and performance analysis of HDDs”, Seagate Technology (Internal Seminar), Shakopee, MN - Aug. 2011.

PROFESSIONAL ACTIVITIES

- Member of,
 - AIAA, SIAM, IEEE, IEEE Control Systems Society (CSS)

SERVICE

- General Chair/Organizer (Conferences)
 - Aerospace Applications Conference (AAC 2015)
- Session Chair (Conferences)
 - *IEEE Aerospace Conference (2015)*
 - *American Control Conference (ACC) (2014)*
- Reviewer
 - *Transactions of the Institute of Measurement and Control*
 - *Journal of Small Satellites,*
 - *AIAA GNC (2010, 2014),*
 - *ASME DSCC (2009),*
 - *National Turkish Aerospace Conference (2007),*
- Technical Committee Membership
 - *IEEE Control Systems Society:*
 - * Aerospace Control TC,
 - * Nonlinear Systems and Control TC
 - * Systems with Uncertainty TC

LANGUAGES

Proficient in English, Turkish and Bulgarian. Intermediate communication knowledge of German.