

# Selim Solmaz's Resume

## *Present Contact Information:*

Hamilton Institute  
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DATE/PLACE OF BIRTH ◇ **17 April 1978, Izmir, Turkey**

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- EDUCATION ◇ **Hamilton Institute, NUI-Maynooth (June 2003 - November 2007)**, Maynooth, IRELAND  
Ph.D. in Control Engineering
- Specializing in switched systems, robust control, model based parameter estimation and adaptive control for automotive applications
  - PhD Thesis: *Topics in automotive rollover prevention: Robust and adaptive switching strategies for estimation and control*. Available online at [www.hamilton.ie/selim](http://www.hamilton.ie/selim)
  - Took part in the FP6 EU funded project CEmACS (Complex Embedded Automotive Control Systems) as part of the PhD work
  - PhD Advisor: Prof. Robert Shorten
- ◇ **Purdue University(August 2001 - May 2003)**, West Lafayette, IN, U.S.A.  
M.S. in Aeronautics and Astronautics
- Major: Dynamics and Control
  - GPA: 3.84/4.0
  - Advisor: Prof. Kathleen C. Howell, Purdue University
- ◇ **Middle East Technical University(September 1998 - June 2001)**, Ankara, TURKEY  
B.S. in Aeronautical Engineering
- GPA: 3.78/4.00 Graduated with highest honors
  - Ranked first in the department
  - In dean's list at all years present (1998-2001) at METU (Middle East Tech. Univ.)
- ◇ **Istanbul Technical University(September 1995 - June 1998)**, Ankara, TURKEY  
B.S. in Naval Architecture & Marine Engineering
- GPA: 3.74/4.00
  - Ranked first in the English prep. classes (September 1995 - June 1996)
  - Ranked First in the department
  - Transferred to Middle East Technical University at the end of the 2nd year
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TEACHING EXPERIENCE ◇ **Occasional Lecturer (Fall 2006, 2007 and Spring 2008 Semesters)**, National Univ. of Ireland-Maynooth, Electronics Engineering Department.

- Taught two Masters-level courses with the titles “EE603 Linear Systems & Modern Control” and “EE618 Kalman Filtering” over 4 semesters on a voluntary basis
- Was responsible for content development, lecturing, as well as grading
- Supervised 2 Masters thesis projects (one still continuing)
- Received excellent feedback from students in “end of year” lecture/lecturer review surveys

- ◇ **Teaching Assistant(2002-2003)**, Purdue Univ., School of Aeronautics & Astronautics West Lafayette, IN, U.S.A
  - Teaching Assistant for AAE490f Signals & Systems (Fall 2002, Spring 2003) and AAE 440 Attitude Determination (Spring 2003) classes
  - Was responsible for grading and tutoring for about 50 students in each class

RESEARCH  
AND WORK  
EXPERIENCE

- ◇ **Research Fellow (November 2007 -)**, Hamilton Institute, National University of Ireland-Maynooth.
  - Employed as principle investigator (PI) to conduct research as part of Enterprise Ireland “Proof of Concept” grants EI PC/2007/128, and EI PC/2008/389
- ◇ **Visiting Researcher (August 2003 - August2004)**, DaimlerChrysler AG Research & Technology, Ride and Handling Technologies Dept., Vehicle Dynamics Group, in Esslingen GERMANY
  - Performed independent research work on advanced nonlinear Kalman filter based observers for vehicle dynamics applications
  - Conducted research work on low cost sidewind estimation & compensation for comfort purposes in passenger cars
  - Designed and simulated a 3D attitude observer, for vehicle dynamics testing applications, based on GPS-INS sensor data fusion
  - Based on my work with GPS, DaimlerChrysler started research on GPS assisted ESP systems
- ◇ **Intern Engineer (July-Sept. 2000)**, EADS (European Aeronautics Defense and Space Company), Numerical Aerodynamics Department, Military Aircraft Division Munich, GERMANY
  - Worked on numerical fluid dynamics
  - Prepared the report “3D RANS Simulation of a Complete X-31 Geometry using Hybrid Grids”. Sept. 2000. Official publication number: EADS/S-PUB 623
- ◇ **Intern Engineer (Aug. 1999 - Dec.2000)**, Research Intern in Aeronautical Eng. Dept., METU Ankara, TURKEY
  - Worked on numerical acoustics
  - Prepared the report “Study on Numerical Simulation & Acoustic Analysis of a Sound Impedance Tube” for Assoc. Prof. Yusuf Ozyoruk
- ◇ **Intern Engineer (July 2000)**, Research Intern in Aeronautical Eng. Dept., METU Ankara, TURKEY
  - Took part in the restoration work of an obsolete C-47 Dakota airplane
- ◇ **Intern Engineer (July-Aug. 1997)**, STFA SEDEF Shipyard, Istanbul,TURKEY
  - Summer practice on construction & assembly of steel ships and general steel manufacturing processes

- RESEARCH GRANTS
- ◇ Enterprise Ireland, "Proof of Concept" commercialization grant EI PC/2008/389, "*SUV Rollover / Tire Pressure Monitor*". Grant secured in December 2008, and commenced in January 1<sup>st</sup>, 2009 (to be completed in March, 2010). I am the PI for this project. Total funding: € 88746
  - ◇ Science Foundation Ireland (SFI), 09/UR/I1524, "Summer Internship on Autonomous Robotics (SIAR)" grant. Project started in Summer 2009, and will end in Summer 2011. Funds 10 undergraduate students during 3 months internship over the summer across three departments (Hamilton Institute, Computer Science, and Electronics Engineering) at NUIM. I am one of the designated student project mentors for this grant. Total funding: € 200000
  - ◇ Enterprise Ireland, "Proof of Concept" commercialization grant EI PC/2007/128, "*Remote Gesture Recognition Device for Automotive Vehicles*". Grant secured in July 2007, and commenced in March 1<sup>st</sup>, 2008 and was completed in September, 2009. I was the PI and the only researcher for this project. Total funding: € 71869
  - ◇ Enterprise Ireland "overheads contribution" grant, 2008. Total funding: € 5000
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- AWARDS & QUALIFICATIONS
- ◇ Irish SFI (Science Foundation Ireland) Fellowship for 4 years (2003-2007) covering full tuition and stipend for Ph.D. at Hamilton Institute, NUI-Maynooth IRELAND (award granted in June 2003)
  - ◇ NATO-A2, 2001 Scholar
  - ◇ Purdue University Engineering Faculty, 2001 Ross Fellowship recipient (covering full tuition and stipend between 2001-2003)
  - ◇ Purdue University, 2001 Koerner Initiation Award
  - ◇ Graduated with Highest Honors from the METU (Middle East Tech. Univ.)
  - ◇ Obtained the top graduation record (3.78/4.00) and ranked 1st in the graduating class at METU Aeronautical Engineering Department
  - ◇ G.M. Lilley "Best Student Design in Aeronautical Engineering" Award, 2000 METU Aeronautical Engineering Department
  - ◇ High honor student in ITU. (Istanbul Technical University) Naval Architecture Dept., 1996-1998
  - ◇ I.T.U. Success Scholarship, 1997
  - ◇ GRE Scores (December 2000): Verbal 410, Quantitative 780, Analytical 780
  - ◇ Computer Based Toefl Scores (October 2000): Total 280, Essay 5
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- PROFESSIONAL TRAINING ACTIVITIES
- ◇ Enterprise Ireland "EnterpriseSTART Programme", which is a training for setting up high-potential start-up companies. Training was held in the Osprey Hotel, Naas, Co. Kildare (March 31 - April 1, 2009)
  - ◇ NUIM "Recruitment Skills Trainign", (March 12, 2009)
  - ◇ NUIM Performance management and development system (PMDS) reviewee training (February 12, 2009)
  - ◇ NUIM "Commercialisation Training Workshop" (May 11, 2006)
  - ◇ Participated in the short course "Applications of Kalman Filtering to GPS, INS, & Navigation", by M.S.Grewal at California State Univ. at Fullerton (January 19-24, 2004)
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PUBLICATIONS

- ◇ Zeheb E., Mason O., Solmaz S., Shorten R., “*On the quadratic stability of switched interval systems: Preliminary results*”, Proceedings of the 2005 IEEE International Symposium on Intelligent Control, 2005 Mediterranean Conference on Control and Automation, 2005.
- ◇ Akar M., Solmaz S., Shorten R., “*Method for Determining the Center of Gravity for an Automotive Vehicle*”, 2006, Irish patent ref: (S2006/0162). PCT International publication number: WO 2007/098891 A1 and PCT/EP2007/001584, September 2007.
- ◇ Zeheb E., Mason O., Solmaz S., Shorten R., “*On the quadratic stability of switched interval systems: Preliminary results*”, International Journal of Control, Vol. 80, No. 6, Page(s):825-831, June 2007.
- ◇ Mason O., Shorten R., Solmaz S., “*On the Kalman-Yakubovich-Popov lemma and common Lyapunov solutions for matrices with regular inertia*”, Linear Algebra and its Applications, 420, Pages(s):183-197, 2007.
- ◇ Solmaz S., Mason O., Shorten R., “*General Inertia and Circle Criterion*”, Proceedings in Applied Mathematics and Mechanics, Vol. 6, Issue 1, Page(s):845-846, December 2006.
- ◇ Solmaz S., Corless M., Shorten R., “*A methodology for the design of robust rollover prevention controllers for automotive vehicles: Part 1-Differential Braking*”, 45th IEEE Conference on Decision and Control, San Diego, CA, Dec 13-15, 2006.
- ◇ Solmaz S., Corless M., Shorten R., “*A methodology for the design of robust rollover prevention controllers for automotive vehicles: Part 2-Active steering*”, American Control Conference, July 11-13, 2007.
- ◇ Solmaz S., Corless M., Shorten R., “*A methodology for the design of robust rollover prevention controllers for automotive vehicles with active steering*”, International Journal of Control, Vol. 80, No. 11, Page(s):1763-1779, November 2007.
- ◇ Solmaz S., Akar M., Shorten R., “*Realtime Multiple-Model Estimation of Center of Gravity Position in Automotive Vehicles*”, Vehicle System Dynamics Journal, Volume 46, Issue 9, Page(s):763-788, September 2008 .
- ◇ Solmaz S., Akar M., Shorten R., “*Online Center of Gravity Estimation in Automotive Vehicles using Multiple Models and Switching*”, 9th IEEE International Conference on Control, Automation, Robotics and Vision, Singapore, Dec 5-8, 2006.
- ◇ Solmaz S., Shorten R., O’Cairbre F., “*A global attractivity result for a class of switching discrete-time systems*”, American Control Conference, July 11-13, 2007.
- ◇ Solmaz S., Shorten R., Wulff K., O’Cairbre F. “*A design methodology for switched discrete time linear systems with applications to automotive roll dynamics control*”, Automatica, Vol. 44, No. 9, Page(s):2358-2363 September 2008.
- ◇ Solmaz S., Akar M., Shorten R., “*Adaptive Rollover Prevention for Automotive Vehicles with Differential Braking*”, Proceedings of the 17th IFAC World Congress, Vol. 17, Part 1, Seoul, Korea, July 6-11, 2008.
- ◇ Solmaz S., Akar M., Shorten R., “*Center of Gravity Estimation and Rollover Prevention Using Multiple Models & Controllers*”, Proceedings of the 14th Yale Workshop on Adaptive & Learning Systems , Page(s):177-183, June 2-4, 2008.
- ◇ Solmaz S., Corless M., Shorten R., “*Padé Approximations of  $e^{Ah}$  and preservation of quadratic Lyapunov functions*”, Proceedings in Applied Mathematics and Mechanics, Vol. 8, Issue 1, Page(s):10807-10808, December 2008.
- ◇ Solmaz S., Shorten R., Mason O., “*Switching Stability of Automotive Roll Dynamics Subject to Interval Uncertainty*”, Proceedings in Applied Mathematics and Mechanics, Vol. 8, Issue 1, Page(s):10921-10922, December 2008.
- ◇ Villegas C., Corless M., Shorten R., Readman M., and Solmaz S., “*Decentralised Control Design of Lateral and Vertical Vehicle Dynamics using Passivity*”, Proceedings in Applied Mathematics and Mechanics, Vol. 8, Issue 1, Page(s):10149-10150, December 2008.

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- ◇ Chiu J., Solmaz S., Corless M., and Shorten R., “*A methodology for the design of robust rollover prevention controllers for automotive vehicles using differential braking*”, International Journal of Vehicle Autonomous Systems, In Press (Accepted in October 2009).
  - ◇ Solmaz S., “*A Remote Gesture Recognition Device for Automotive Vehicles*”, Project Report for Enterprise-Ireland Research Commercialization Grant PC/2007/0128, September 2009.
  - ◇ Solmaz S., Shorten R., “*Method for determining the tire conditions of a vehicle*”, 2009, European Patent Application No. 09010853.1, August 2009.
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UNIVERSITY  
PROJECTS

- ◇ “A Study on the Circular Restricted Three Body Dynamics, and Orbital Transfers” AAE 590, Independent Study with Prof. Kathleen C. Howell, Purdue Spring 2003
  - ◇ “Optimal State Estimation and Linear Kalman Filtering ” AAE 590, Independent Study with Prof. Arthur E. Frazho, Purdue Spring 2003
  - ◇ “A Study on the stability of the Equilateral Equilibrium Points L4 and L5 in the Restricted Circular Three Body Problem” AAE 632, Advanced Orbital Dynamics, Purdue Spring 2002, course grade: AA
  - ◇ “Time Optimization of Apollo Lunar Module Ascent Stage with Changing Mass Properties and Quasi-Spherical Moon Assumption” AAE 508, Optimization in Aerospace Engineering, Purdue Spring 2002, course grade: AA
  - ◇ “System Analysis and Feed-Back Controller Design of a Double Pendulum Configuration on Cart” AAE 564, System Analysis & Synthesis, Purdue Fall 2001, course grade: AA
  - ◇ “A Study on Alternative Burn Schemes for the Annihilation of Angular Momentum Bias of Spin-Stabilized Axially-Thrusting Spacecraft” AAE 507, Principles of Dynamics, Purdue Fall 2001, course grade: AA
  - ◇ “Design and Production of a Radio-controlled, Two-engine Tilt Ducted V/STOL UAV ” (A modified version of it participated in 1999-2000 AIAA/Cessna/ONR Student Design/Build/Fly Competition) AEE 452, Aeronautical Engineering Design II project, METU Spring 2000, course grade: AA
  - ◇ “Off-Design Cycle Analysis of Aircraft Gas Turbine Engines” AEE 474, Aircraft Engine Design” project, METU Spring 2000, course grade: AA
  - ◇ “Conceptual Design of a Radio-controlled, Two-engine V/STOL UAV” AEE 451, Aeronautical Engineering Design project, METU Fall 1999, course grade: AA. Awarded with G.M. Lilley “Best Student Design in Aeronautical Engineering” nominated by METU
  - ◇ “Numerical Simulation of Supersonic Flow on a 2D Bump, Using Method of Characteristics” AEE 497, Special Topics in Hypersonic Flow project, METU Fall 1999, course grade: AA
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SKILLS

- ◇ Programming Languages: Fortran , ANSI C, Matlab, Python, html, TeX
  - ◇ Various Software : MikteX, MS Office, MS Visio, Matlab, Mathcad, AutoCAD, Dymola, Satellite Toolkit, Tecplot, Adobe Photoshop, Adobe Illustrator
  - ◇ Languages: Turkish (Very good), English (Very good), German (Basic)
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AREAS OF  
INTEREST

- ◇ Dynamics and Control of Vehicles
- ◇ Optimal State Estimation and Kalman Filtering
- ◇ Adaptive & Robust Control
- ◇ Mechatronics & Robotics

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- ◇ High Performance Vehicles
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PROFESSIONAL AFFILIATIONS ◇ IEEE, Institute of Electrical and Electronics Engineers (member since 2006)  
◇ AIAA, American Institute of Aeronautics and Astronautics (Student member 1999-2001)

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JOURNAL REFERENCE ◇ Vehicle Systems Dynamics, IET Control Theory and Applications, International Journal of System Science, Mechatronics, Journal of Zhejiang University-SCIENCE A.

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REFERENCES ◇ Prof. Robert Shorten, Hamilton Institute, National University of Ireland-Maynooth, IRELAND (*robert.shorten@nuim.ie*, Phone: +353 1 7086100, Fax: +353 1 7086269)  
◇ Prof. Martin Corless, School of Aeronautics and Astronautics, Purdue University West Lafayette, Neil Armstrong Hall of Engineering, 701 West Stadium Ave, West Lafayette, IN 47907-2045 USA (*corless@purdue.edu*, Phone: +1 765 4947411, Fax: +1 765 4940307)  
◇ Dr. Jens Kalkkuhl, Daimler AG, Group Research & Advanced Engineering 059/X552 - GR/EAV, 71059, Sindelfingen, GERMANY. (*jens.c.kalkkuhl@daimler.com*, Phone: +49 7031 9061632, Mobile: +49 173 2337702, Fax: +49 711 3052111770)  
◇ Dr. John Scanlan, Commercialization Office, National University of Ireland-Maynooth, IRELAND (*john.scanlan@nuim.ie*, Phone: +353 1 7086017 , Fax: +353 1 7086953)