Assoc. Prof. Dr. Selim Solmaz's Resume

Present Contact Information:
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DATE/PLACE ◇ **17 April 1978, Izmir, Turkey**
OF BIRTH

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
- 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

◇ **Anadolu University-Open University Program (September 2011 - June 2013)**, Eskiehir, TURKEY
Vocational School Diploma in Electric Energy Production, Transmission & Distribution

- GPA: 3.4/4.00
- Honour student

TEACHING EXPERIENCE

⬦ **Lecturer (2010 -2016)**, Gediz University, Faculty of Engineering & Architecture, Mechanicl Engineering Department.

  · Taught numerous undergraduate and graduate level courses including MAT101 Mathematics, MAT201 Linear Algebra & Differential Equations, MEC203 Thermodynamics, MEC208 Dynamics, MEC308 Control Systems, MAK303 Engineering Applications, MAK401 Mech. Engineerin Lab., MAK407 Graduate Research Project, MAK408 Graduate Thesis, MEC410 Automotive Dynamics & Control, MAK417 Internal Combustion Engines, MLP527 System Analysis & Synthesis, MLP548 Automotive Dynamics, MLP537 Wind Turbines-I, SDK361 Introduction of Aerospace Engineering

  · Was responsible for content development, lecturing, as well as grading

  · Received excellent feedback from students in "end of semester" lecture/lecturer review surveys.

⬦ **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

  · Received excellent feedback from students in "end of year" lecture/lecturer review surveys

  · Supervised 4 summer intern projects (2 still continuing)

⬦ **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

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RESEARCH AND WORK EXPERIENCE

⬦ **Head of Graduate School of Science (Mar - July 2016)**, Gediz University

⬦ **Associate Professor (Sept. 2013 - July 2016)**, Gediz University, Mech. Eng. Dept.

⬦ **Assistant Professor (September 2010 - 2013)**, Gediz University, Mech. Eng. Dept.

  · Employment includes duties such as conducting research, teaching, student mentoring, participating in departmental and faculty meetings, consultancy assignments with the industry, etc.

⬦ **Research Fellow (November 2007 - August 2010)**, 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. Also supported 3 different research projects.

⬦ **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

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RESEARCH GRANTS

⋄ TUBITAK-BIGG 1512 Entrepreneurship Grant , 2150210, "Hybrid Multicopter Drone", July 2015-2016. I am the PI for this project. Total funding: 150000 TL

⋄ Gediz University BAP , 2015EYL-6, "A novel rotary gasoline engine with changing combustion chamber", February-August 2016. I was the PI for this project. Total funding: 22500 TL

⋄ Izmir Development Agency,"Vocational Training Program and Laboratory for Renewable Energy Sector", April 2014-April 2015. I was the Technical coordinator for this project. Total funding: 736000 TL

⋄ KOSGEB,"A novel in-wheel electric motor for hybrid and electric vehicles", R&D and Innovation Fund. May 2014-May 2015. I was the entrepreneur and technical coordinator for this project. Total funding: 191000 TL

⋄ Izmir Development Agency,"Renewable Energy Power Plant with a 500 kW Solar-Wind Hybrid Technology", May 2013-May 2014. I was the Technical coordinator for this project. Total funding: 2232000 TL

⋄ TUBITAK 1003 "Strategic Research Projects", 113M070, "Rollover and Lateral Stability Control of Hybrid Vehicles based on Adaptive Torque Regulation", September 2013-December 2015. Total Funding: 430000 TL

⋄ Enterprise Ireland, "Proof of Concept" commercialization grant EI PC/2008/389, "*SUV Rollover / Tire Pressure Monitor*". Grant secured in December 2008, and completed in March 2010. I was 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 1st, 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

AWARDS & QUALIFICA- TIONS

◇ Gediz University Academic Success Award, 2015

◇ Shell Eco-Marathon Turkey, Technical Innovation Award, 2015

◇ Best Paper Award, AMSS Society, 2015

◇ Citation in the Enterprise Ireland "Best of 2008" Irish Researchers

◇ 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

◇ KPDS (December 2010): Total 95/100

PROFESSION- AL 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 Training", (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)

ORGANIZA- TION ACTIVITIES

◇ Member of the organizing committee for "3rd Hamilton Institute Workshop on Nonnegative Matrices and Related Topics" (August 5-7th, 2008) conference website

◇ Member of the organizing committee, member of the science committee, and member of the editorial board for the proceedings book in "2nd International Symposium on Computing in Science & Engineering (ISCSE 2011)" (June 1-4th, 2011) conference website

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PUBLICA-
TIONS

◇ 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.

⋄ 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.

⋄ 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, Vol. 8, No. 2/3, Page(s): 146-170, 2010.

⋄ Solmaz S., "*Switched Stable Roll Dynamics Control Design for Automotive Vehicles using Active Suspension*" 1st International Symposium on Computing in Science and Engineering (ISCSE10), Kuşadası, Aydın, June 3-5, 2010.

⋄ Solmaz S., Başlamışlı Ç.,"*A Nonlinear Sideslip Observer Design Methodology for Automotive Vehicles Based on a Rational Tire Model*", 5th International Conference on Automotive Technologies (OTEKON 2010), Bursa, June 7-8, 2010.

⋄ Başlamışlı Ç., Solmaz S., "*Construction of a Rational Tire Model for High Fidelity Vehicle Dynamics Simulation under Extreme Driving and Environmental Conditions*", Proceedings of 10th Biennial Conference on Engineering Systems Design and Analysis (ESDA10), İstanbul, July 12-14. 2010.

⋄ Solmaz S., Başlamışlı Ç., "*A Nonlinear Observer Design Methodology for Simultaneous Estimation of Sideslip Angle and Lateral Tire Forces*", 10th International Symposium on Advanced Vehicle Control (AVEC10), Loughborough, August 22-26, 2010.

⋄ Solmaz S., Shorten R., "*Indirect Tire Condition Estimation using Lateral Dynamics*", 10th International Symposium on Advanced Vehicle Control (AVEC10), Loughborough, August 22-26, 2010.

⋄ Sajja S., Solmaz S., Shorten R., Corless M., "*Preservation of Common Quadratic Lyapunov Functions and Pade Approximations*" , *To be Presented* at 49th IEEE Conference on Decision and Control, December 15-17, 2010.

⋄ Yıldız S., Solmaz S., "*Effects of Non Profit Organizations on Mitigation of Climate Change: Carbon Capture and Storage* ", 7th NGOs Congress, December 3-5, Çannakkale, Turkey 2010.

⋄ Solmaz S., Başlamışlı Ç., "*Integrated Decentralized Automotive Dynamics Tracking Controllers that Account for Structural Uncertainty*", 2nd International Symposium on Computing in Science & Engineering (ISCSE 2011), Kuşadası, Aydın, Turkey, June 1-4, 2011.

⋄ Solmaz S., Coşkun T., "*Development of a Vehicle Dynamics Prototyping Platform based on a Remote Control Model Car*", 2nd International Symposium on Computing in Science & Engineering (ISCSE 2011), Kuşadası, Aydın, Turkey, June 1-4, 2011.

⋄ Filiz S., Solmaz S., "*Measurement and Analysis of Employee Activity Levels at Work Spaces: A Case Study at Gediz University*", 2nd International Symposium on Computing in Science & Engineering (ISCSE 2011), Kuşadası, Aydın, Turkey, June 1-4, 2011.

⋄ Solmaz S., Yağcı B., "*Estimation of Incoming Ocean Waves using Kalman Filter for use in Adaptive Ocean Power Converters*", 2nd International Symposium on Computing in Science & Engineering (ISCSE 2011), Kuşadası, Aydın, Turkey, June 1-4, 2011.

⋄ Solmaz S., Başlamışlı Ç., "*A Nonlinear Sideslip Observer Design Methodology for Automotive Vehicles Based on a Rational Tire Model*", International Journal of Advanced Manufacturing Technology, *In Press*, 2011. (doi:10.1007/s00170-011-3587-9)

$\diamond$ Shorten R., Corless M., Sajja S., Solmaz S., "*On Padé approximations, quadratic stability and discretization of switched linear systems*", Systems & Control Letters, Volume 60, Issue 9, Page(s):683–689, 2011. (doi:10.1016/j.sysconle.2011.04.024)

$\diamond$ Solmaz S., "*A Switched Stable Control Design Methodology Applied to Vehicle Rollover Prevention based on Switched Suspension Settings*", IET Control Theory and Applications Journal, Volume 5, Issue 9, Page(s):1104–1112 , 16 June 2011. (doi:10.1049/iet-cta.2010.0361)

SKILLS

$\diamond$ Programming Languages: Fortran , ANSI C, Matlab, Python, html, TeX

$\diamond$ Various Software : MikteX, MS Office, MS Visio, Matlab, Mathcad, AutoCAD, Dymola, Satellite Toolkit, Tecplot, Adobe Photoshop, Adobe Illustrator

$\diamond$ Languages: Turkish (Very good), English (Very good), German (Basic)

AREAS OF
INTEREST

$\diamond$ Dynamics and Control of Vehicles

$\diamond$ Renewable Energy Systems

$\diamond$ State Estimation and Control

$\diamond$ Adaptive & Robust Control

$\diamond$ Mechatronics & Robotics

PROFESSIONAL
AFFILIATIONS

$\diamond$ MAKTED, Machine Theory Organization of Turkey (member since 2015)

$\diamond$ Li-DER, Unlicensed Electric Production Organization (member since 2012)

$\diamond$ MMO, Mechanical Engineering Chamber of Turkey (member since 2010)

$\diamond$ IEEE, Institute of Electrical and Electronics Engineers (member 2006-2010)

$\diamond$ AIAA, American Institute of Aeronautics and Astronautics (Student member 1999-2001)

JOURNAL
REFREE

$\diamond$ IEEE Transactions on Intelligent Transportation Systems, Vehicle Systems Dynamics, IET Control Theory and Applications, International Journal of System Science, Mechatronics, Journal of Zhejiang University-SCIENCE A.

REFERENCES

$\diamond$ Prof. Robert Shorten, Hamilton Institute, National University of Ireland-Maynooth, IRELAND (*robert.shorten@gmail.com*, Phone: +353 87 6862319)

$\diamond$ 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)

$\diamond$ 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)

$\diamond$ Dr. John Scanlan, Commercialization Office, National University of Ireland-Maynooth, IRELAND (*john.scanlan@nuim.ie*, Phone: +353 1 7086017 , Fax: +353 1 7086953)