1 Dec, 2020

# Curriculum Vitae

**Name:** Ahmet Onat
**Birth date:** 24 September 1969
**Academic Title:** Associate Professor, Mechatronics

## Education

- PhD: Electrical and Electronic Eng., Kyoto University (Japan), 1999
- MS: Electrical and Electronic Eng., Kyoto University (Japan), 1995
- Undergraduate: Electronics and communication Eng., Istanbul Technical University, 1991

## Work Experience:

- Sabanci University, Faculty of Engineering and Natural Sciences, Mechatronics Program, associate professor, 2000-.
- Kyoto University (Japan), Faculty of Aeronautics and Astronautics, postdoctoral researcher, 1999-2000.
- Istanbul Technical University, Faculty of Electrical and Electronic Engineering; research assistant, 1991-1992,

## Research Interests

Reinforcement learning for the characterization of dynamic systems; linear synchronous motor design and drive methods; embedded systems, Internet of Things, real-time systems; distributed coordination of autonomous underwater robots.

## Web page

`http://people.sabanciuniv.edu/onat`

## Projects

1. Wide Field Monitor Experiment of the Enhanced X-Ray Timing and Polarimetry (eXTP) project, a joint mission of European Space Agency (ESA) and Institute of High Energy Physics(IHEP), Chinese Academy of Sciences. Consortium includes 27 countries. Duration 24 months. Budget of Sabanci University contribution: 217,000USD. Deliverables: Safety critical software specification and development for the experiment management system on the satellite platform. Role: Researcher. `https://www.isdc.unige.ch/extp/`
2. Smart and Networking Underwater Robots in Cooperation Meshes, "SWARMs", H2020 ECSEL project, 2015 – 2018. Project no: 662107. Duration 36 months, total budget 17.3M EUR, Sabanci Univ. budget 515,400EUR. Deliverables: Networked control of autonomous underwater

vehicles (robotic submarine) under poor communication and visibility conditions. Member of consortium of 30 partners. Role: Country PI. `http://www.swarms.eu`

3. "A prototype development for portable power generation with vertical axis wind turbines (VAWT) for communication towers", Sabanci University Internal Project Grant, 9/2012 – 8/2015, 109,000 TL Description: Design and implementation of small scale wind turbines suitable for placement on off-grid towers. Aerodynamic, electrical and control of the local wind power generator system. I have worked on electronic and control aspects of the project. Role: Researcher.

4. Drive and Safety Methods for New Generation Elevator Systems, Phase 2, with Japanese elevator company, 2010-2012. Duration 30 months. Budget: 450,000USD. Deliverable: Design and development of other novel ideas in linear motor design and implementation, publications, patents, linear motor prototype and design know-how. Role: Primary investigator. 2010 Nov-2014 Feb.

5. Data Acquisition and Remote Diagnostics for Commercial Vehicles. Turkish bus and truck manufacturing company, 2008-2010. Duration 24 months, budget:145,000USD, Deliverable: Fault diagnostics system based on vehicle LAN, fault reporting over cellular network, fault analysis and reporting database system, papers. (TUBITAK SANTEZ), Role: Primary investigator.

6. Drive and Safety Methods for New Generation Elevator Systems, funded by a Japanese Company, 2007-2009. Duration 24 months, budget:150,000USD, deliverable: Design and construction of large payload linear motor and electromechanical brake system design method, prototype, patent application, papers. Role: Primary investigator.

7. Control over Lossy Communication Networks(TUBITAK 1001), Sabanci University, 2007–2009. Duration 24 months, budget: 110,000USD. Deliverable: Networked control computer design method, papers. Primary investigator.

8. Nano-fiber Woven Wing Application for Micro Aerial Vehicle, Sabanci University, 2005–2007. Duration: 24 months, budget: 150,000USD. Deliverable: Prototype. Role: Researcher

9. "Sabanci University Robotics Research Laboratory Platform(TÜBITAK 1001), Sabanci University, 2006-2009. Duration: 36 months, budget: 300,000USD. Deliverable: Humanoid walking robot prototype with 29 degrees of freedom. Role: Researcher

10. Design and prototyping of a general purpose, open architecture computing, communication and electronics system for a micro system assembly and manipulation workstation (for Government), 2005-2007. Duration 2 years, budget 700,000USD, outcome prototype. Internal project code: EACF 05-00268 Role: Researcher

11. Solar car prototype. Design, material selection and prototyping of electronic subsystem, consultation for mechanical design, Sabanci University, 2005. Budget 15,000USD, deliverable prototype.

12. Automatic Fabric Labeling System, Control System Design Consultant, 2004–2005; duration1year, budget 40,000 USD, outcome prototype. Internal project code: EACF 05-00260

13. Design of a very small footprint, expandable real-time Linux operating system, 2003-2005. Duration 2 years, budget 5,000USD, deliverable prototype, conference paper.

14. Design and implementation of Multi-Legged Walking Robot for the Study of Emergent Gait Patterns, Kyoto University, Japan, 1999. Duration 1 year, budget 40,000 USD, deliverables prototype, journal papers conference papers.

## Memberships

1. Council member of Institute of Complex Medical Engineering, Japan, 2016 – Present
2. Turkish National Committee for Automatic Control.
3. Land Vehicles Technology Panel, Turkish Ministry of National Defense 2015-2017
4. ABIGEM; European Union Business Development Center, Development Consultant. 2005 – 2010
5. Steinbeis GMBH, Steinbeis Turkey, Steinbeis Sabanci University Mechatronics 2004 –
6. IEEE 2004 –

## Awards

1. Best paper award: International Conference on Complex Medical Engineering 2015, Sandor Markon, Satoshi Maekawa, Ahmet Onat, "Context oriented medical visualization with floating images"
2. Best paper award: International Conference on Complex Medical Engineering ICME CME2014, Sandor Markon, Ahmet Onat, Satoshi Maekawa "Multi-Modal Interaction for Medical Visualization with Floating Images"
3. FP6 project proposal support grant, TUBITAK. Subject: "Design and prototyping of sensor networks to be used in disaster rescue. 2004.
4. Japanese government scholarship (Monbusho) for full support during MS and Ph.D. studies, 1993-1999.
5. Highest level certificate in the Japanese language level proficiency test 1999
6. Kyoto Shimbun Company (Kyoto Newspaper), financial support towards the doctoral degree award, 1998.

## International Research Visits

1. Kyoto University, Kyoto, Japan, July, 2019 - August 2020 (Sabbatical leave).
2. International Center for Theoretical Physics (Trieste, Italy), IoT lectures 2019.
3. International Center for Theoretical Physics (Trieste, Italy), IoT lectures 2018.
4. Numerous visits to Kobe Institute of Computing, Japan, between 2007 – present.
5. 2012 June, Malardalen University, Sweden, Erasmus teaching staff mobility program.
6. 2010 August-September, National Institute of Information and Communications Technology (NICT), Japan. Design of robotic user interface for 3D display device.
7. 2007, 2010 numerous short visits, Japan, Fujitec Co. Ltd., Linear motor design and control methods.
8. 2006 August-September, Kyoto University, Japan. Networked Control Systems.
9. 2004 August, Maribor University Slovenia. Fast prototyping in embedded systems.
10. 2001 August. Kyoto University, Japan. Data acquisition in the walking experiments of Myriapod walking robot, design and implementation of non-holonomic robot with vision system.

## Publications

### Books

1. Alphan Ulusoy, Ozgur Gurbuz, Ahmet Onat, "Cooperative Wireless Model Based Predictive Networked Control Systems: Design, Implementation and Analysis", Lambert Academic Publishing, ISBN: 978-3843373999, 2010.
2. Mehmet Emrah Parlakay, Ahmet Onat, "Model Based Predictive Networked Control Systems: Methods, Design and Implementation", Lambert Academic Publishing, ISBN: 978-3838353746, 2010.

### Book Chapters

1. Alphan Ulusoy, Ozgur Gurbuz, Ahmet Onat, "Wireless Control Networks with Real-Time Constraints", in: "Industrial Wireless Sensor Networks: Applications, Protocols, Standards, and Products", CRC press, ISBN 9781466500525, 2017.

### Journal Papers

1. A. Onat, S. Markon, "Theoretical and Experimental Analysis of Eddy Current Contacless Speed Sensors for Linear Motor Elevators", under preparation.
2. S. Nourizadeh, M. Soomro, O. Erdemir, O. Gurbuz, A. Onat, "A Hybrid Acoustic and RF Communication Method for Networked Control of Autonomous Underwater Vehicle: Design and Co-Simulation", submitted to Turkish Journal of Electrical Engineering and Computer Science, 2020.
3. A.Agababaoglu, V. Tavakol Aghaei, S. Yildirim, A. Onat, "A Real-Time Application of Markov Chain Monte-Carlo Method for Bayesian Trajectory Control of a Robotic Manipulator", submitted to ISA Transactions, Elsevier, 2019
4. Ahmet Onat, Ender Kazan, Sandor Markon, "Development and Applications of Linear Motor Elevators", Denki Hyoronsha (Japan), Vol 105, No 5, pp 46-52, 2020
5. Vahid Tavakol Aghaei, Ahmet Onat, Sinan Yıldırım, "A Markov chain Monte Carlo algorithm for Bayesian policy search", Systems Science and Control Engineering, Taylor & Francis, Vol 6, No1, pp438-455, 2018
6. Ahmet Onat, Cagri Gurbuz, Sandor Markon, "A New Active Position Sensing Method for Ropeless Elevator", Elsevier Mechatronics (SCI), Vol. 23, pp 182-189, 2013.
7. Kazan E., Onat A., "Modeling of Air Core Permanent-Magnet Linear Motors with a Simplified Nonlinear Magnetic Analysis", IEEE Transactions on Magnetics (SCI), Vol.47, No.6, pp 1753–1762, 2011.
8. Onat A., Naskali T, Parlakay E, Mutluer O, "Control over Imperfect Networks: Model Based Predictive Networked Control Systems", IEEE Transactions on Industrial Electronics (SCI), Vol.58, No.3, pp. 905-913, 2011.
9. Alphan Ulusoy, Ozgur Gurbuz, Ahmet Onat, "Wireless Model Based Predictive Networked Control System Over Cooperative Wireless Network", IEEE Transactions on Industrial Informatics (SCI-E), Vol.7, No.1, pp.41–51, 2011

10. Gurbuz C., Kazan E., Onat A., Markon S., "Linear Motor for Multi-Car Elevators, Design and Position Measurement" (invited paper), Turkish Journal on Electrical Engineering and Computer Sciences (SCI-E), Vol. 19, No. 6, pp 827–838, 2011.

11. Kemalettin Erbatur, Utku Seven, Evrim Taskiran, Ozer Koca, Metin Yilmaz, Mustafa Unel, Gullu Kiziltas, Asif Sabanovic, Ahmet Onat, "Design and control of the humanoid robot SURALP"(invited paper), Turkish Journal of Electrical Engineering and Computer Sciences, (SCI-E), Vol. 19, No. 5, pp 725–731, 2011.

12. Onat A., Kazan E., Norio T., Daisuke M., Komatsu Y., Markon S., "Design and Implementation of a Linear Motor for Multi-Car Elevators", IEEE Transactions on Mechatronics (SCI), Vol.15, No.5, pp.685-693, 2010.

13. S. Yannier, A. Sabanovic, A. Onat, M. Bastan "Sliding Mode Based Behavior Control", International Journal of Information Technology, ISSN 1305-2403, Vol1, Issue 1, pp 1-12, 2005.

14. S. Yannier, A. Sabanovic, A. Onat, "Realization of Reactive Control for Multi Purpose Mobile Agents", Journal of Electronics Engineering, IU, JEEE, ISSN 1303-0914, Vol. 4, No. 2, pp. 1161-1170, 2004.

15. Tsujita, K.Tsuchiya, A. Onat, "Decentralized Autonomous Control of a Quadruped Locomotion Robot using Oscillators", Artificial Life and Robotics (Springer), 5, 158-162, 2000.

16. A. Onat, H. Kita and Y. Nishikawa, "A Study on Architecture, Algorithms and Internal Representation for Reinforcement Learning with Recurrent Neural Networks", Transactions of the Society of Instrument and Control Engineers (Japan), Vol. 35, No. 12, pp. 1599-1608, 1999.

17. A. Onat, H. Kita, and Y. Nishikawa, "Reinforcement Learning of Dynamic Behavior by using Recurrent Neural Networks", Journal of Artificial Life and Robotics (Springer), Vol. 1, No. 3, pp. 117-121, 1997.

**Patents**

1. "A Nonlinear and Efficient Eddy-Current Overspeed Protection System for Elevators", inventors: Ahmet Onat, Sandor Markon, 13 Sept, 2018, WO2018164649A1

2. "Position detection device for movable magnet type linear motor", inventors: Sandor Markon, Ahmet Onat, granted 26 June 2014, CN102804566A, US20120091928, WO2011001555A1...

3. "Moving magnet type linear motor", inventors: Sandor Markon, Ender Kazan, Ahmet Onat, granted Aug 6, 2013, CN102171915A, EP2333942A1, EP2333942A4, US8502421, US20110221282, WO2010038325A1...

**Conference Papers (International)**

1. Vahid Tavakol Aghaei, Arda Ağababaoğlu, Ahmet Onat, Sinan Yıldırım, "Bayesian Learning for Policy Search in Trajectory Control of a Planar Manipulator", IEEE 9th Annual Computing and Communication Workshop and Conference (CCWC), pp 240-246, 2019

2. Mehrullah Soomro, Saeed Nourizadeh Azar, Ozgur Gurbuz, Ahmet Onat, "Work-in-Progress: Networked Control of Autonomous Underwater Vehicles with Acoustic and Radio Frequency Hybrid Communication", IEEE Real-Time Systems Symposium (RTSS), pp366-368, 2017

3. Vahid Tavakol Aghaei, Ahmet Onat, "Tuning Scaling Factors of Fuzzy Logic Controllers via

Reinforcement Learning Policy Gradient Algorithms", 3 rd International Conference on Mechatronics and Robotics Engineering, Paris, France, February 8-12, 2017

4. A.O. Onol, A. Onat, S. Yesilyurt, "Comparisons of Controller Performance for Small-Scale Verti-cal Axis Wind Turbines", 2017 American Control Conference, IEEE, pp 4698-4703, 2017

5. AO Onol, U Sancar, A Onat, S Yesilyurt, "Modeling, Hardware-in-the-Loop Simulations and Control Design for Small-Scale Vertical Axis Wind Turbines", ASME 2016 Dynamic Systems and Control Conference, DSCC2016, DSCC2016-9855, 2016

6. S. Markon, S. Maekawa, A. Onat. "Context-Oriented Medical Visualization with Floating Images", 9th International Conference on Complex Medical Engineering, ICME, 2015 (**Best paper award**)

7. U. Sancar, A.O. Onol, A. Onat, S. Yesilyurt. "Hardware-in-the-Loop Simulations and Control Design for a Small Vertical Axis Wind Turbine", XXV International Conference on Information, Communication and Automation Technologies (ICAT), 2015

8. A.O. Onol, U. Sancar, A. Onat, S. Yesilyurt. "Model Predictive Control for Energy Maximization of Small Vertical Axis Wind Turbines",ASME 2015 Dynamic Systems and Control Conference, V001T05A003, 2015

9. V.T. Aghaei, A. Onat, I. Eksin, M. Guzelkaya. "Fuzzy PID controller design using Q-learning algorithm with a manipulated reward function", IEEE European Control Conference (ECC), pp. 2502-2507, (DOI: 10.1109/ECC.2015.7330914), 2015

10. S. Markon, S. Maekawa, and A. Onat. "Multi-Modal Interaction for Medical Visualization with Floating Images", 2014 ICME International Conference on Complex Medical Engineering (CME), pp. 462–466, IEEE 2014 (**Best paper award**)

11. N. Takahashi, S. Markon, A. Onat. "Multi-objective optimization of the design of an elevator linear motor", 2013 IEEE Power & Energy Society General Meeting, pp 1-5, (DOI:10.1109/ PESMG.2013.6672412), 2013.

12. S. Markon, H. Miyake, S. Maekawa, A. Onat, and Z. Zhao. "Improved interaction methods for medical visualization with floating images", 2013 ICME International Conference on Complex Medical Engineering (CME), pp. 462–466, IEEE 2013

13. Alphan Ulusoy, Ahmet Onat, Ozgur Gurbuz, "Wireless Model Based Predictive Networked Control System Over IEEE 802.15.4", 5th International Workshop on Performance Control in Wireless Sensor Networks, PWSN 2013.

14. Markon S., Maekawa S., Onat A., "Robot-Assisted Medical Visualization with Floating Images", International Symposium on Network Enabled Health Informatics, Biomedicine and Bioinformatics, Istanbul, 2012.

15. Markon S., Maekawa S., Onat A., Furukawa H., "Interactive Medical Visualization with Floating Images", International Conference on Complex Medical Engineering, ICME 2012, pp.20-23, Japan, 2012.

16. C. Gurbuz, A. Onat, "A New Active Position Sensing Method for Ropeless Elevator", LDIA11, Linear Drives in Industry Applications, pp. MLT-II.3, 2011.

17. Markon S., Onat A., Kazan E., Gurbuz C., "Linear Motor Coils as Position Sensors", LDIA09, Linear Drives and Industrial Applications Conference, accepted, 2009.

18. Ulusoy A., Onat A., Gurbuz O., "Wireless Model Based Predictive Networked Control System", 8th IFAC Conference on Fieldbusses and Networks in Industrial and Embedded Systems, pp

40–48, 2009.

19. Erbatur K, Seven U., Taskiran E, Koca O., Yilmaz M., Unel M., Kiziltas G., Sabanovic A., Onat A., "SURALP:A New Full-Body Humanoid Robot Platform", IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS), pp4949–4954, 2009.

20. Onat A., Naskali T., Parlakay A. "Model Based Predictive Networked Control Systems", IFAC08 World Congress, pp 13000–13005, 2008.

21. Erbatur K, Seven U., Taskiran E, Koca O., Kiziltas G., Unel M., Sabanovic A., Onat A., "SURALP-L The Leg Module of a New Humanoid Robot Platform", IEEE Intl Conf on Humanoid Robots, 2008.

22. Onat A., Parlakay M.E., "Implementation of Model Based Networked Predictive Control System", RTLWS09, pp 85–93, 2007.

23. S. Markon Y. Komatsu, A. Yamanaka, A. Onat, E. Kazan, "Linear Motor Coils as Brake Actuators for Multi-Car Elevators", ICEMS07, CDROM proceedings, 2007.

24. S. Markon, Y Komatsu, A Onat, A. Yamanaka, E. Kazan, "Linear Motor Coils as Brake Actuators for Multi-Car Elevators, LDIA07, CDROM proceedings, 2007.

25. A.T. Naskali, A. Onat, "Random Network Delay in Model Based Predictive Networked Control Systems", WSEAS Intl. Conf. on Aplied Computer Science, pp 199–206, 2006.

26. A. Sabanovic, A. Onat, "Generalized Motion Control; A SMC Perspective", IEEE Conference on Electric Drives and Power Electronics EDPE'05, Croatia, Vol1, pp 178–183, 2005.

27. Yannier S., Sabanovic A., Onat A., Bastan M., "Sliding Mode Based Obstacle Avoidance and Target Tracking for Mobile Robots", ISIE'05, Vol 2, pp 1489-1494, 2005.

28. Yannier S., Sabanovic A., Onat A. and Bastan M., "Sliding Mode Based Behavior Control for Mobile Robots", REM workshop, France, 2005.

29. Yannier, S., Sabanovic, A. and Onat, A., "Basic Configuration for Mobile Robots", IEEE International Conference on Industrial Technology ICIT2003, pp.256-261, 2003.

30. Sozbilir, O., Sabanovic, A., Goktug, G., and Onat, A., "A proposed Architecture for Remote Mechatronics Laboratory", Proc. Advanced Motion Control Conference, July 07-09, pp.561-566, 2002.

31. Tsujita, K. , Tsuchiya, K., Onat A., "Adaptive Gait Pattern Control of a Quadruped Locomotion Robot", Proc 2001 IEEE Intl. Conf. Intelligent Robots and Systems (IROS),pp 2318–2325, 2001.

32. A. Onat, K. Tsuchiya, K.Tsujita, "Decentralized Autonomous Control of a Myriapod Locomotion Robot", Proc. 1st International Conference on Information Technology in Mechatronics, pp. 191-196, 2001.

33. K.Tsujita, K.Tsuchiya, A.Onat, S.Aoi, M.Kawakami, "Locomotion Control of a Multipod Locomotion Robot with CPG Principles", Proc. Sixth International Symposium on Artificial Life and Robotics, Vol.2, pp. 421-426, 2001.

34. K.Tsujita, K.Tsuchiya and A. Onat, "Decentralized Autonomous Control of a Quadruped Locomotion Robot", Proc. International Symposium on Adaptive Motion of Animals and Machines, E-18, 2000.

35. K. Tsujita, A. Onat, K. Tsuchiya and Y. Kawano, "Autonomous Decentralized Control of a Quadruped Locomotion Robot using Oscillators", Proc. Fifth International Symposium on

Artificial Life and Robotics(AROB), Vol. 2, pp. 703-710, 2000.

36. A. Onat, N. Kosino, M. Kuramitu and H. Kita, "Reinforcement Learning under Incomplete Perception using Stochastic Gradient Ascent and Recurrent Neural Networks", Proc. IEEE International Conference on Systems, Man, and Cybernetics(IEEE SMC), Vol. 5, pp. 481-486, 1999.

37. A. Onat, H. Kita and Y. Nishikawa, "Q-learning with Recurrent Neural Networks as a Controller for the Inverted Pendulum Problem", Proc. The Fifth International Conference on Neural Information Processing (ICONIP), pp. 837-840, 1998.

38. A. Onat, H. Kita, and Y. Nishikawa, "Recurrent Neural Networks for Reinforcement Learning: Architecture, Learning Algorithms, and Internal Representation", Proc. World Congress on Computational Intelligence, pp. 2010-2015, 1998.

39. A. Onat, H. Kita, and Y. Nishikawa, "Reinforcement Learning of Dynamic Behavior by Using Recurrent Neural Networks", Proc. 1st International Symposium on Artificial Life and Robotics, pp. 98-101, 1996.

40. A. Onat, H. Kita, and Y. Nishikawa, "Reinforcement Learning of Dynamic Behavior by Using Recurrent Neural Networks", Proc. World Congress on Neural Networks, Vol. 2, pp. 342-345, 1995.

## Conference Papers (Turkey)

1. Mercedes Terrones , Ahmet Onat, "Olaya Dayalı Model Ongorulu Kontrol", Proc. TOK, pp. 206-210, Turkey 2012.

2. Gurbuz C., Onat A. , Markon S., "Lineer Motorlar Icin Aktif Pozisyon Olcum Yontemi", Proc. TOK, pp. 530–535, 2011.

3. Sipahi Y., Onat A., "Gelistirilmis Genisletilmis Yapay Sinir Aglari", Proc. TOK, pp., 2011.

4. Gurbuz C., Kazan E., Onat A., Markon S.,"Lineer Motorlu Asansorler icin Guvenilir Surus Yontemleri", TOK09, best student paper award, 2009.

5. Erbatur K, Seven U., Taskiran E, Koca O., Kiziltas G., Unel M., Sabanovic A., Onat A., "SURALP-L Insansi Robot Platformu Bacak Modülü", Proc. TOK 2007.

6. A. Teoman Naskali, Ahmet Onat, Ozan Mutluer, "Modele Dayali Ongorulu Ag Baglantili Kontrol Sistemi", Proc. TOK 2007, Vol.1, pp , 2007.

7. M. Bastan, A. Onat, S. Yannier, A. Sabanovic, "Gezgin Robotlarin Potansiyel Alan Metoduyla Goruntu isleme Kullanilarak Kontrol Edilmesi", in the Proceedings of TOK'05, Vol 1, pp 319-323, 2005.

8. Murat Gunay, Asif Sabanovic, Nadira Sabanovic, Ahmet Onat, Anahtarlamali Guc Ceviricilerinin Akimlarinda Toplam Harmonik Distorsiyonun Azaltilmasi, Proc. TOK'02, Ankara, 2002, Turkey, pp.

9. Gurbuz, A., Sozbilir, O., Sabanovic, A., Onat, A., Goktug, G., Piezo robot MICMOR, Proc. TOK'02, Ankara, 2002, Turkey, pp.

10. Yannier, S., Sabanovic, A. and Onat, A., "Mobil Robotlar için Engelden Sakindiran ve Hedefe Yonlendiren Katmanli Denetim Yontemi", in the Proceedings of ELECO'02, 18-22 December, Bursa, 2002, Turkey, pp. 168-172.

## Conference Papers (Japan)

1. N. Koshino, A. Onat, M. Kuramitsu, H. Kita, "Reinforcement Learning of Recurrent Neural Networks by Means of the Stochastic Gradient Algorithm", Proc. 42nd Annual Conference of the Institute of Systems, Control and Information Engineers(Japan), pp. 337-338, 1998 (in Japanese).
2. A. Onat, H. Kita and Y. Nishikawa, "Controlling an Inverted Pendulum by Reinforcement Learning with Recurrent Neural Networks", 25th SICE Symposium on Intelligent Systems (Japan), pp. 149-154, 1998.
3. T. Takenouchi, A. Onat, H. Kita and Y. Nishikawa, "Comparison of Algorithms for Reinforcement Learning with Recurrent Neural Networks", Proc. 41th Annual Conference of the Institute of Systems, Control and Information Engineers (Japan), pp. 43-44, 1997 (in Japanese).
4. A. Onat, H. Kita, and Y. Nishikawa, "A Study on Learning Algorithms and Architecture of Recurrent Neural Networks for Reinforcement Learning", Proc. 9th SICE Symposium on Decentralized Autonomous Systems (Japan), pp. 67-72, 1997.
5. A. Onat, H. Kita, and Y. Nishikawa, "Reinforcement Learning with Recurrent Neural Networks", Proc. 39th Annual Conference of the Institute of Systems, Control and Information Engineers (Japan), pp. 65-66, 1995.

## Turkish Non-Academic Journal Publications

1. Onat A., Kazan E., Gurbuz C., Markon S., "Lineer Senkron Motorlarin Tasarimi, Imalati ve Kullanim Alanlari", Otomasyon, 2009.
2. A. Onat, G. Goktug, S. Yesilyurt, K. Tsuchiya, K. Tsujita, "Cok Bacakli Robotun Merkezsiz Otonom Kontrolu", Otomasyon, pp. 100-105, 2003.
3. S. Izmit, E. Parlakay, A. Onat, "Linux'la Gercek Zamanli Motor Kontrolu ve Goruntu isleme", Otomasyon, pp.50-52, 2003.

## Thesis Supervision

### PhD Theses:

1. "Markov Chain Monte Carlo Algorithm for Bayesian Policy Search", Vahid Tavakol Aghaei, 2019.
2. "Protocol design for full duplex communication method for networked control", Saeed Nourizadeh, 9/2016 – ongoing.

### Ms Theses:

1. UsamahYaseen Osman, "Energy Optimization of a Vertical Axis Wind Turbine Using Markov Chain Monte Carlo Method: Analysis and Hardware In-The-Loop Simulation", presentation stage, 2020.
2. Gokalp Cetin, "Network Topologies for Long Armature Linear Multi-Car Elevator Systems", 2020.

3. Can Alper Onol, "Reinforcement Learning for large scale elevator group control", ongoing, 2019.
4. Arda Agababaoglu, "Bayesian Reinforcement Learning with MCMC to Maximize Energy Output of Vertical Axis Wind Turbine", 2019
5. Serhat Emre Cebeci, "Prioritized Experince Deep Deterministic Policy Gradient Method for Dynamic Systems", 2019.
6. Oytun Erdemir, "Decentralized Autonomous Docking Maneuver for Underwater Autonomous Vehicles with Radio Frequency Communication: Design and Hardware-in-the-Loop Simulation", 02/2018.
7. Mehrullah Soomro, "Communication and Control of Autonomous Underwater Vehicles using Radio Frequency – Acoustic Hybrid MAC Schemes" 02/2015 – 01/2017
8. Aykut Ozgun Onol, "Modeling, Hardware-in-the-Loop Simulations and Control Design for a Vertical Axis Wind Turbine with High Solidity", 9/2014 – 8/2016.
9. Ugur Sancar, "Modelling and Control of Hardware in the Loop Simulation of VAWT with Electronic Load", MS, /2013 – 8/2015
10. Kubra Karayagiz, "Network Topologies for Long Armature Linear Motors", MS, 9/2011 – 1/2013
11. Sena Ergullu, "Residual Generation and Fault Diagnosis of Rechargeable Lead-Acid Batteries", Mar. 2009 – Jan 2011.
12. Yusuf Sipahi, "Wide area network for vehicle diagnostics", MS, Mechatronics, Mar 2009 – Feb 2011.
13. Cagri Gurbuz, "Active position measurement method for linear motor elevators", MS, Mechatronics, Sept. 2008 – Dec.2010.
14. Ayse Nese Tufekciler, "Dynamic balancing of underactuated robots", MS, Mechatronics, 1 Oct. 2007 – 21 Jan. 2010.
15. Yigit Resit Okan, "Energy and power management in series hybrid vehicles", MS, Mechatronics, 1 Feb. 2007 – 5 Feb. 2009.
16. Alphan Ulusoy, "Design implementation and analysis of wireless model based predictive networked control system over cooperative wireless network", MS, Electronics, 1 Oct. 2007 – 15 Aug. 2009.
17. Ender Kazan, "Design and implementation of a linear motor for multi-car elevators", MS, Mechatronics, 1 Sept. 2007 – 2 Jul. 2009.
18. Ozan Mutluer, "Stability and implementation of model based predictive networked control system", MS, Mechatronics, 1 Mar. 2007 – 28 Jul. 2009.
19. Mehmet Emrah Parlakay, "Implementation of a distributed control system using real-time operating system", Ms, Mechatronics, 01 Sept. 2004 – 14 Aug 2007.
20. Ahmet Teoman Naskali, "Model Based Predictive Networked Control systems", 1 Oct 2004 – 1 Jul 2006
21. Bastan M., "Visual Servoing of Mobile Robots using Potential Fields", Sabanci Univ, 2004
22. Bahadir K. "Sensorless Control of Induction Machine", Sabanci Univ,(co-advisor) 2004
23. Yannier S., "Realization of Reactive Control for Multi Purpose Mobile Agents", Sabanci Univ, 2002.

24. Gunay M., "Minimisation of Instantaneous Total Harmonic Distortion of Currents for Three-Phase Switching Power Converters", Sabanci Univ, 2002 (co-advisor).

**Bs Theses:**

1. N. Koshino "Reinforcement Learning of Recurrent Neural Networks by Means of the Stochastic Gradient Algorithm", Kyoto University, (Japan), 1999

2. T. Takenouchi "Recurrent Neural Networks in Reinforcement Learning", Kyoto University, (Japan), 1998.

3. In Sabanci University, graduation theses are given as a separate course. About three groups of three students each year have been advised between 2001- to date.

## Courses Taught

### ME407 Embedded systems 2002-

Fundamentals of design methods and technology of embedded systems. Integration of the measurement and actuators with embedded controller. Implementation of control algorithms. Interfacing the embedded controllers to network. Labs cover introduction to real-time Linux on an industrial computer, periodic task generation, data acquisition device drivers etc. A semester long project supports the course.

### EE525 Real-Time Systems Design 2002-

Introduction to real-time systems, real-time software design , concurrent programming and process interactions, real-time operating system, processing scheduling Case study: high performance real-time application, process communication, deadlock management distributed real-time systems, fault tolerance. Lab work: Implementation of real-time scheduling theory with RTOS on an ARM based microprocessor.

### ENS206 System Modeling and Control 2001, 2013-2016

Examples of physical and abstract systems and their mathematical models. Classification of dynamic system models linearity and time invariance; finite state discrete event systems. Tools of analysis for linear systems: transform techniques, input-output analysis, block diagrams, frequency response representation. Introduction to stability and closed loop system design. Introduction to supervisory control for discrete event systems.

### ME303 Control System Design 2016-2018

Introductory linear control systems course. Feedback control, time and frequency domain design, root locus, stability, Bode and Nyquist plots, state space methods, discrete time implementation. Lab work: DC motor system identification and control.

## 0.1 Me408 Mechatronic System Design 2018-

Integration of the fundamental subjects of mechatronic systems. The course focuses on analog front ends, discrete time signal processing, control, power electronics, actuators, mechanics and sensors in an implementation oriented course that ends up in the design and physical implementation of a mechatronic system. The course has lab sessions and an on-going project which is designed, built up in stages by the students, and presented at the end of the semester.

### TE409 Signal Processing Design and Implementation 2002-2018

Development of real-time digital signal processing (DSP) systems using a DSP microprocessor; several structured laboratory exercises, such as sampling and real-time time discrete-time filtering, median filtering, FFT implementation. Lab work implementing Sampling, FIR, IIR, FFT on 2 DSP platforms, one with assembly, the other with 'C' language. A semester long project supports the course.

### EE561 DSP systems Design and Implementation 2004-2018

A study of theory and practice in the design and implementation of DSP algorithms on programmable processors, multiprocessors, and ASICs. Specification, evaluation, and implementation of real-time DSP software applications on embedded DSP-based environments. Lab and project work.

### ME308 Industrial Control 2002,2003

This course covers industrial control systems. The specific topics include: control system architectures; transducers and actuators; secondary transducers; measurement; amplification; errors; communication in industrial control systems industrial LANs; sequential logic control; programmable logic controllers; direct digital control and supervisory control; structures of SCADA systems; case studies.

### EE524 Industrial Automation 2002, 2003

Code sharing with Industrial Control.