

## Asst. Prof. Mumin Tolga EMİRLER

### Personal Information

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### International Researcher IDs

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### Biography

Mümin Tolga Emirler is currently an assistant professor in the Department of Aviation Electronics of Yildiz Technical University, Turkey. He received his B.Sc. degree both in Mechanical Engineering in 2007 and in Manufacturing Engineering (double major with high honour) in 2008, his M.Sc. degree in Mechatronics Engineering in 2010 and his Ph.D. degree in Mechanical Engineering in 2015, all from Istanbul Technical University, Turkey. He worked as a postdoctoral scholar at the Ohio State University Center for Automotive Research in 2015. He served as an assistant professor of mechanical engineering at Istanbul Okan University from 2016 to 2019. His current research interests include applied robust control systems, vehicle dynamics control, advanced driver assistance systems, connected and automated vehicles and mechatronic systems. He is a member of the International Federation of Automatic Control (IFAC) Technical Committee on Automotive Control, and Technical Committee on Intelligent Autonomous Vehicles.

### Education Information

Doctorate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Makina Mühendisliği, Turkey 2010 - 2015

Postgraduate, Istanbul Technical University, Fen Bilimleri Enstitüsü, Mekatronik Mühendisliği, Turkey 2007 - 2010

Undergraduate Double Major, Istanbul Technical University, Makina Fakültesi, İmalat Mühendisliği, Turkey 2004 - 2008

Undergraduate, Istanbul Technical University, Makina Fakültesi, Makina Mühendisliği, Turkey 2002 - 2007

### Foreign Languages

English, C1 Advanced

### Certificates, Courses and Trainings

Vocational Training, 9th CISM-AIMETA Advanced School on Vehicle Dynamics, Control and Design, CISM - INTERNATIONAL CENTRE FOR MECHANICAL SCIENCES, 2023

Vocational Training, International Intelligent Vehicles Summer School, Université de Technologie de Compiègne, France, 2017

## Dissertations

Doctorate, ADVANCED CONTROL SYSTEMS FOR GROUND VEHICLES, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Makina Mühendisliği, 2014

Postgraduate, TAŞIT SAVRULMA AÇISAL HIZININ SANAL SENSÖR KULLANILARAK TAHMİN EDİLMESİ VE TAŞIT YANAL DİNAMİĞİNİN KONTROLÜ, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Mekatronik Mühendisliği, 2010

## Research Areas

Control and System Engineering, Checker, Mechanical Engineering, System Dynamics and Control, Vehicle Systems Dynamics, Mechatronics

## Academic Titles / Tasks

Assistant Professor, Yildiz Technical University, Faculty Of Electrical & Electronics, Control And Automation Engineering, 2023 - Continues

Assistant Professor, Yildiz Technical University, Faculty Of Applied Sciences, Aviation Electronics, 2019 - Continues

Assistant Professor, Istanbul Okan University, Faculty Of Engineering, Makina Mühendisliği, 2016 - 2019

Researcher, Ohio State University, Center For Automotive Research, Automated Driving Lab, 2015 - 2015

## Academic and Administrative Experience

Fakülte Yönetim Kurulu Üyesi, Yildiz Technical University, Faculty Of Applied Sciences, 2020 - Continues

Fakülte Kurulu Üyesi, Yildiz Technical University, Faculty Of Applied Sciences, 2020 - Continues

Deputy Head of Department, Yildiz Technical University, Faculty of Applied Sciences, Aviation Electronics, 2019 - Continues

Vice Dean, Yildiz Technical University, Faculty Of Applied Sciences, Aviation Electronics, 2020 - 2021

## Designed Lessons

Emirler M. T., Advanced Control Methods for Dynamic Systems, Postgraduate, 2020 - 2021

Emirler M. T., Automated Driving Control Systems, Doctorate, 2019 - 2020

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Disturbance Observer Based Active Independent Front Steering Control for Improving Vehicle Yaw Stability and Tire Utilization**  
Gozu M., ÖZKAN B., EMİRLER M. T.  
INTERNATIONAL JOURNAL OF AUTOMOTIVE TECHNOLOGY, vol.23, no.3, pp.841-854, 2022 (SCI-Expanded)
- II. **Graphical two-term control system design considering time delay margin and time-integral performance criterion**  
Emirler M. T.  
ELECTRONICS LETTERS, vol.54, no.23, pp.1319-1320, 2018 (SCI-Expanded)
- III. **Design and Evaluation of Robust Cooperative Adaptive Cruise Control Systems in Parameter Space**  
Emirler M. T., Guvenc L., Guvenc B. A.  
INTERNATIONAL JOURNAL OF AUTOMOTIVE TECHNOLOGY, vol.19, no.2, pp.359-367, 2018 (SCI-Expanded)
- IV. **Multi-objective parameter space approach based controller and add-on disturbance observer design**  
Emirler M. T., Guvenc B. A.  
JOURNAL OF MECHANICAL SCIENCE AND TECHNOLOGY, vol.31, no.9, pp.4447-4458, 2017 (SCI-Expanded)

- V. **Vehicle dynamics modelling and validation for hardware-in-the-loop testing of electronic stability control**  
Emirler M. T., UYGAN I. M. C., Gelbal S. Y., GÖZÜ M., BÖKE T. A., Guvenc B. A., Guvenc L.  
INTERNATIONAL JOURNAL OF VEHICLE DESIGN, vol.71, pp.191-211, 2016 (SCI-Expanded)
- VI. **Lateral stability control of fully electric vehicles**  
Emirler M. T., Kahraman K., Senturk M., Acar O. U., Guvenc B. A., Guvenc L., EFENDİOĞLU B.  
INTERNATIONAL JOURNAL OF AUTOMOTIVE TECHNOLOGY, vol.16, no.2, pp.317-328, 2015 (SCI-Expanded)
- VII. **Cooperative Adaptive Cruise Control Implementation of Team Mekar at the Grand Cooperative Driving Challenge**  
Guvenc L., Uygan I. M. C., Kahraman K., Karaahmetoglu R., Altay I., Senturk M., Emirler M. T., Karci A. E. H., Guvenc B. A., Altuğ E., et al.  
IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, vol.13, no.3, pp.1062-1074, 2012 (SCI-Expanded)
- VIII. **Semicompliant Force Generator Mechanism Design for a Required Impact and Contact Forces**  
Demirel B., Emirler M. T., Sonmez U., Yorukoglu A.  
JOURNAL OF MECHANISMS AND ROBOTICS-TRANSACTIONS OF THE ASME, vol.2, no.4, 2010 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Investigation of Different Communication Topologies for Cooperative Adaptive Cruise Control Systems**  
Gülden B., EMİRLER M. T.  
International Journal of Automotive Science and Technology, vol.8, no.1, pp.150-158, 2024 (Scopus)
- II. **Lateral Stability Control of Articulated Heavy Vehicles Based on Active Steering System**  
Emheisen M. A. A., Emirler M. T., Özkan B.  
International Journal of Mechanical Engineering and Robotics Research, vol.11, no.8, pp.575-582, 2022 (Scopus)
- III. **Otonom Taşıtlar için Hıza Bağlı Kazanç Uyarlamalı LQI Tabanlı Yol Takip Kontrol Sistemi Tasarımı**  
EMİRLER M. T.  
Gazi Üniversitesi Fen Bilimleri Dergisi Part C: Tasarım ve Teknoloji, vol.7, no.4, pp.855-868, 2019 (Peer-Reviewed Journal)
- IV. **Evaluation of electronic stability controllers using hardware-in-the-loop vehicle simulator**  
EMİRLER M. T., GÖZÜ M., UYGAN İ. M. C., BÖKE T. A., AKSUN GÜVENÇ B., GÜVENÇ L.  
Advances in Automotive Engineering, vol.1, pp.123-141, 2018 (Peer-Reviewed Journal)
- V. **Compensation of time delay effect in vehicle yaw stability control systems by using communication disturbance observer**  
EMİRLER M. T., AKSUN GÜVENÇ B., GÜVENÇ L.  
PAMUKKALE UNIVERSITY JOURNAL OF ENGINEERING SCIENCES-PAMUKKALE UNIVERSITESI MUHENDISLIK BILIMLERI DERGISI, vol.24, pp.1450-1457, 2018 (Peer-Reviewed Journal)
- VI. **Robust PID steering control in parameter space for highly automated driving**  
Emirler M. T., Uygan I. M. C., Aksun Güvenç B., Güvenç L.  
International Journal of Vehicular Technology, vol.2014, 2014 (Scopus)
- VII. **Vehicle yaw rate estimation using a virtual sensor**  
Emirler M. T., Kahraman K., Şentürk M., Aksun Güvenç B., Güvenç L., EFENDİOĞLU B.  
International Journal of Vehicular Technology, vol.2013, 2013 (Scopus)

## Books & Book Chapters

- I. **Path Following Control System Design and Analysis of Autonomous Vehicles**  
EMİRLER M. T.

in: Autonomous Vehicles and Systems: A Technological and Societal Perspective, Ishwar Sethi, Editor, River Publishers, Gistrup, pp.335-360, 2024

**II. Control of Mechatronic Systems**

GÜVENÇ L., AKSUN GÜVENÇ B., DEMİREL B., EMİRLER M. T.

The Institution of Engineering and Technology IET, 2017

**III. Connected and Autonomous Vehicles**

GÜVENÇ L., AKSUN GÜVENÇ B., EMİRLER M. T.

in: Internet of Things and Data Analytics Handbook, Hwaiyu Geng, Editor, Wiley, 2016

**IV. Partially Compliant Force-Generator Mechanism**

SÖNMEZ Ü., DEMİREL B., EMİRLER M. T., YÖRÜKOĞLU A.

in: Handbook of Compliant Mechanisms, Larry L. Howell, Spencer P. Magleby, Brian M. Olsen, Editor, Wiley, 2013

## Refereed Congress / Symposium Publications in Proceedings

**I. İki Serbestlik Dereceli Helikopter Sistemi için Kontrol Sistemi Tasarımı ve Analizi**

Çakır M., Emirler M. T., Fotuhi M. J.

10. ULUSLARARASI MÜHENDİSLİK VE TEKNOLOJİ YÖNETİMİ KONGRESİ, İstanbul, Turkey, 14 - 15 October 2023, pp.281-288

**II. Otonom Araçlar için Kooperatif Adaptif Seyir Kontrol Sistemi Tasarımı ve CARLA-MATLAB/Simulink Ortamında Benzetimi**

Sarihan S., Yalçın M. F., Kaynar E., EMİRLER M. T.

TOK'2023 24. Otomatik Kontrol Ulusal Toplantısı, İstanbul, Turkey, 14 - 16 September 2023, pp.93-99

**III. Dört Rotorlu Bir İnsansız Hava Aracı için Parametre Uzayı Tabanlı İç Çevrim Açısız Hız Kontrol Sistemi Tasarımı ve Benzetimi**

Özdemir M., EMİRLER M. T.

TOK'2023 24. Otomatik Kontrol Ulusal Toplantısı, İstanbul, Turkey, 14 - 16 September 2023, pp.119-125

**IV. Elektrikli Araçlardaki Kablo Yönlendirmeli Direksiyon Sistemleri için Tehlike Analizi ve Risk Değerlendirmesi**

Özçetin O., EMİRLER M. T.

TOK'2023 24. Otomatik Kontrol Ulusal Toplantısı, İstanbul, Turkey, 14 - 16 September 2023, pp.790-796

**V. Rear Wheel Independent Drive Electric Vehicle Yaw Stability Control System Design and Analysis**

KOÇ C. T., EMİRLER M. T.

2022 International Conference on Theoretical and Applied Computer Science and Engineering (ICTASCE), Turkey, 29 September 2022, pp.175-180

**VI. Estimation of sideslip angle for highly automated vehicles using experimental data**

DORAN S., EMİRLER M. T.

International Conference on Advanced Technologies (ICAT'22), Turkey, 25 November 2022, pp.365-369

**VII. Ağ Merkezli Otonom Sürü İnsansız Hava Aracı Sistemlerinde Doğal Afetler Sırasında Hedef Paylaşımı için Bir Öneri: Karınca Kolonisi Optimizasyonu**

Güler İ., EMİRLER M. T.

4th International Engineering Research Symposium INERS'22, Düzce, Turkey, 04 March 2022

**VIII. Automated Driving Architecture and Operation of A Light Commercial Vehicle**

Gözü M., EMİRLER M. T., Uygan İ. M. C., Böke T. A., GÜVENÇ L., AKSUN GÜVENÇ B.

10th International Automotive Technologies Congress - OTEKON 2020, Turkey, 06 September 2021

**IX. Active Independent Front Steering Based Vehicle Yaw Stability Control**

Gözü M., ÖZKAN B., EMİRLER M. T.

5th International Conference on Advances in Mechanical Engineering, İstanbul, Turkey, 17 - 19 December 2019

**X. Comparison of different time delay compensation methods for networked DC motor speed control**

Suulker C., Emirler M. T.

6th International Conference on Electrical and Electronics Engineering, ICEEE 2019, İstanbul, Turkey, 16 - 17 April

2019, pp.225-229

- XI. **Active Steering Control of Articulated Heavy Vehicles for Improving Lateral Performance**  
Emheisen M., EMİRLER M. T., Özkan B.  
9. Uluslararası Otomotiv Teknolojileri Kongresi-OTEKON, Bursa, Turkey, 07 May 2018, pp.771-779
- XII. **Tekerlek Kayma Açılarını Değiştirerek Tekerlek-Yol Sürtünme Katsayısının Tahmin Edilmesi**  
GÖZÜ M., Özkan B., EMİRLER M. T.  
9. Uluslararası Otomotiv Teknolojileri Kongresi-OTEKON, İstanbul, Turkey, 07 May 2018, pp.703-713
- XIII. **Zaman Gecikmesi Gözleyicisinin Taşıt Savrulma Dinamiği Kontrolüne Uygulanması**  
EMİRLER M. T., AKSUN GÜVENÇ B., GÜVENÇ L.  
TOK 2017 Otomatik Kontrol Ulusal Toplantısı, İstanbul, Turkey, 21 - 23 September 2017
- XIV. **A Cooperating Autonomous Road Vehicle Platform**  
EMİRLER M. T., UYGAN İ. M. C., ALTAY İ., ACAR O. U., KELEŞ T., AKSUN GÜVENÇ B., GÜVENÇ L.  
IFAC Workshop on Advances in Control and Automation Theory for Transportation Applications, İstanbul, Turkey, 16 - 17 September 2013, vol.46, pp.199-204
- XV. **Donanım İçeren Taşıt Simülasyon Sistemi ile Elektronik Kararlılık Kontrolcüsünün Değerlendirilmesi**  
EMİRLER M. T., GÖZÜ M., UYGAN İ. M. C., BÖKE T. A., AKSUN GÜVENÇ B., GÜVENÇ L.  
8. Otomotiv Teknolojileri Kongresi - OTEKON, Bursa, Turkey, 23 May 2016, pp.1-9
- XVI. **Estimation of Vehicle Yaw Rate Using a Virtual Sensor with a Speed Scheduled Observer**  
Kahraman K., Emirler M. T., Şentürk K., Aksun Güvenç B., Güvenç L., Efendioğlu B.  
6th IFAC Symposium Advances in Automotive Control, Munich, Germany, 12 - 14 July 2010, vol.43, no.7, pp.632-637
- XVII. **Socially Acceptable Collision Avoidance System for Vulnerable Road Users**  
Emirler M. T., Wang H., Guvenc B. A.  
14th IFAC Symposium on Control in Transportation Systems (CTS), İstanbul, Turkey, 18 - 20 May 2016, vol.49, pp.436-441
- XVIII. **Automated Robust Path Following Control Based on Calculation of Lateral Deviation and Yaw Angle Error**  
EMİRLER M. T., WANG H., AKSUN GÜVENÇ B., GÜVENÇ L.  
ASME 2015 Dynamic Systems and Control Conference, Columbus, Ohio, United States Of America, 28 - 30 October 2015
- XIX. **Modular heavy duty vehicle modelling and user interface development**  
Emirler M. T., Uygan I. M. C., KÖPRÜBAŞI K., ÜNVER B., Güveng B. A., Güveng L.  
4th IFAC Workshop on Engine and Powertrain Control, Simulation and Modeling, E-COSM 2015, Ohio, United States Of America, 23 - 26 August 2015, vol.28, pp.354-360
- XX. **Estimation of road vehicle yaw rate using a virtual sensor and an observer**  
EMİRLER M. T., KAHRAMAN K., AKSUN GÜVENÇ B., GÜVENÇ L., EFENDİOĞLU B.  
2009 European Control Conference (ECC), Budapest, Hungary, 23 - 26 August 2009
- XXI. **Donanım İçeren Taşıt Simülatörü için Taşıt Dinamiği Modelinin Oluşturulması ve Model Doğrulama Çalışması**  
EMİRLER M. T., UYGAN İ. M. C., GELBAL Ş. Y., GÖZÜ M., BÖKE T. A., AKSUN GÜVENÇ B., GÜVENÇ L.  
7. Otomotiv Teknolojileri Kongresi - OTEKON, İstanbul, Turkey, 26 May 2014, pp.1-7
- XXII. **Communication disturbance observer approach to control of integral plant with time delay**  
Emirler M. T., Guvenc B. A., Guvenc L.  
2013 9th Asian Control Conference, ASCC 2013, İstanbul, Turkey, 23 - 26 June 2013
- XXIII. **Offline and Hardware in the Loop Model-System Development for Electronic Stability Control of a Fully Electric Vehicle**  
KAHRAMAN K., ŞENTÜRK M., EMİRLER M. T., BOZKURT E., AKSUN GÜVENÇ B., GÜVENÇ L., EFENDİOĞLU B.  
6. Otomotiv Teknolojileri Kongresi - OTEKON, Bursa, Turkey, 04 June 2012, pp.1-8
- XXIV. **Integrated Lateral Stability Control for Fully Electric Vehicles**  
EMİRLER M. T., KAHRAMAN K., ŞENTÜRK M., ACAR O. U., AKSUN GÜVENÇ B., GÜVENÇ L., EFENDİOĞLU B.  
ACD 2011, 9th European Workshop on Advanced Control and Diagnosis, Budapest, Hungary, 17 - 18 November

2011

- XXV. **Team Mekar's GCDC 2011 Vehicle Platform**  
UYGAN İ. M. C., ALTAY İ., KARAAHMETOĞLU R., KAHRAMAN K., ŞENTÜRK M., TURAN M. C., TAŞ Ö. Ş., EMİRLER M. T., BOZKURT E., HARTAVİ KARCI A. E., et al.  
8th International Automotive Congress (IAC), 16 - 17 May 2011
- XXVI. **Binek Araçlarında Sanal Savrulma Açısız Hız Ölçeri Uygulaması**  
ŞENTÜRK M., EMİRLER M. T., KAHRAMAN K., GÜVENÇ L., AKSUN GÜVENÇ B., EFENDİOĞLU B.  
5. Otomotiv Teknolojileri Kongresi - OTEKON, Bursa, Turkey, 07 June 2010, pp.1-8
- XXVII. **Virtual Yaw Rate Sensor Design using Matlab-Simulink**  
EFENDİOĞLU B., EMİRLER M. T., ŞENTÜRK M., KAHRAMAN K., GÜVENÇ L., AKSUN GÜVENÇ B.  
14th Conference for Computer-Aided Engineering and System Modeling, Ankara, Turkey, 05 November 2009, pp.1-6
- XXVIII. **Sanal Sensör Kullanılarak Savrulma Açısız Hızının Tahmin Edilmesi**  
EMİRLER M. T., KAHRAMAN K., ŞENTÜRK M., AKSUN GÜVENÇ B., GÜVENÇ L., EFENDİOĞLU B.  
TOK 2009 Otomatik Kontrol Ulusal Toplantısı, İstanbul, Turkey, 13 October 2009, vol.1, pp.360-365
- XXIX. **Compliant impact generator for required impact and contact force**  
Demirel B., Emirler M. T., Yörükoğlu A., Koca N., Sönmez Ü.  
2008 ASME International Mechanical Engineering Congress and Exposition, IMECE 2008, Boston, MA, United States Of America, 31 October - 06 November 2008, vol.11, pp.373-379

## Patent

Emirler M. T., Yaw angular velocity measuring system, Patent, CHAPTER B Implementation of Operations; Transport, The Invention Registration Number: EP2287057B1 , Standard Registration, 2016

## Metrics

Publication: 49

Citation (WoS): 79

Citation (Scopus): 173

H-Index (WoS): 3

H-Index (Scopus): 7

## Awards

EMİRLER M. T., Excellent Oral Presentation Certificate, 6th International Conference on Electrical and Electronics Engineering (ICEEE 2019), April 2019

## Non Academic Experience

Ohio State University, Center for Automotive Research, Automated Driving Lab