

Assoc. Prof. HALİL ERSİN SÖKEN

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Biography

Dr. Halil Ersin Soken is an Assistant Professor at Aerospace Engineering Department of Middle East Technical University, Ankara, Turkey. Previously he worked at TUBITAK Space Technologies Research Institute (TUBITAK Uzay) and contributed to the institute's ongoing satellite projects. In addition, he was a project research associate at JAXA Institute of Space and Astronautical Science, where he worked on attitude determination algorithms for small satellites. He has collaborations at international level for various researches on attitude determination and control system design for small satellites.

Education Information

Doctorate, Graduate University for Advanced Studies, Physical Sciences, Space and Astronautical Science, Japan 2010 - 2013

Postgraduate, Istanbul Technical University, Uçak Ve Uzay Bilimleri, Turkey 2007 - 2009

Undergraduate, Istanbul Technical University, Uçak Ve Uzay Bilimleri, Uçak Mühendisliği, Turkey 2003 - 2008

Undergraduate, Istanbul Technical University, Uçak Ve Uzay Bilimleri, Uzay Mühendisliği, Turkey 2003 - 2007

Foreign Languages

Japanese, A2 Elementary

English, C2 Mastery

Certificates, Courses and Trainings

IT, MATLAB Educator's Worksop, Mathworks, 2022

Dissertations

Doctorate, UKF Adaptation and Filter Integration for Attitude Determination and Control of Nanosatellites with Magnetic Sensors and Actuators, Graduate University for Advanced Studies, Physical Sciences, Space and Astronautical Science,

2013

Postgraduate, Kalman Filtering Applications on Attitude Determination of ITU-PSAT I Satellite, Istanbul Technical University, Uçak Ve Uzay Bilimleri, Uzay Mühendisliği, 2009

Research Areas

Aeronautical Engineering , Space Engineering

Academic Titles / Tasks

Associate Professor, Middle East Technical University, Faculty of Engineering, Department of Aerospace Engineering, 2023 - Continues

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Aerospace Engineering, 2020 - 2023

Research Assistant, Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, 2010 - 2013

Research Assistant, Istanbul Technical University, Uçak Ve Uzay Bilimleri, Uçak Mühendisliği, 2010 - 2010

Academic and Administrative Experience

Deputy Head of Department, Middle East Technical University, Faculty of Engineering, Department of Aerospace Engineering, 2021 - 2024

Courses

Inertial Navigation Systems, Undergraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020, 2018 - 2019

Flight Mechanics, Undergraduate, 2021 - 2022, 2020 - 2021

Spacecraft Dynamics, Undergraduate, 2021 - 2022

Applied Orbital Mechanics, Postgraduate, 2021 - 2022, 2020 - 2021, 2019 - 2020

System Dynamics, Undergraduate, 2020 - 2021

Jury Memberships

Competition, NASA Space Apps Challenge Ankara, Orta Doğu Teknik Üniversitesi, October, 2021

Doctorate, Doctorate, İstanbul Teknik Üniversitesi, August, 2021

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Relative position estimation using modulated magnetic field for close proximity formation flight**
Shibata T., SÖKEN H. E., Sakai S.
AEROSPACE SCIENCE AND TECHNOLOGY, vol.155, 2024 (SCI-Expanded)
- II. **Computationally Efficient Attitude Estimation for Small Satellites Using Integrated Measurements**
Benli D., SÖKEN H. E.
IEEE SENSORS JOURNAL, vol.24, no.14, pp.22877-22884, 2024 (SCI-Expanded)
- III. **Analog sun sensor measurement correction using deep neural network**
SÖKEN H. E., Sozen S. N., Gokce M., Yavuzylmaz C., Gulmammadov F.
Acta Astronautica, vol.211, pp.808-817, 2023 (SCI-Expanded)

- IV. **Incorporating delayed star tracker measurements in Gokturk-2 satellite attitude filter**
Kahraman O., SÖKEN H. E.
Advances in Space Research, vol.72, no.2, pp.200-210, 2023 (SCI-Expanded)
- V. **Real-Time Attitude Independent Calibration of Spinning Spacecraft Magnetometers Using Quasi-Measurements**
Cetin M. E., SÖKEN H. E., Sakai S.
JOURNAL OF THE ASTRONAUTICAL SCIENCES, vol.69, no.6, pp.1726-1743, 2022 (SCI-Expanded)
- VI. **Backup Magnetometer-Only Attitude Estimation Algorithm for Small Satellites**
Yakupoglu-Altuntas S., Eşit M., Söken H. E., Hajiyev C.
IEEE Sensors Journal, vol.22, no.13, pp.13544-13551, 2022 (SCI-Expanded)
- VII. **Attitude filtering for nanosatellites: A comparison of different approaches under model uncertainties**
Esit M., Yakupoglu S., Söken H. E.
Advances in Space Research, vol.68, no.6, pp.2551-2564, 2021 (SCI-Expanded)
- VIII. **Robust Attitude Estimation Using IMU-Only Measurements**
Candan B., SÖKEN H. E.
IEEE Transactions on Instrumentation and Measurement, vol.70, 2021 (SCI-Expanded)
- IX. **Filtering-Based Three-Axis Attitude Determination Package for Spinning Spacecraft: Preliminary Results with Arase**
Söken H. E., Sakai S., Asamura K., Nakamura Y., Takashima T., Shinohara I.
AEROSPACE, vol.7, no.7, 2020 (SCI-Expanded)
- X. **A new likelihood approach to autonomous multiple model estimation**
Söken H. E., Sakai S.
ISA TRANSACTIONS, vol.99, pp.50-58, 2020 (SCI-Expanded)
- XI. **Attitude estimation and magnetometer calibration using reconfigurable TRIAD plus filtering approach**
Soken H. E., Sakai S.
AEROSPACE SCIENCE AND TECHNOLOGY, vol.99, 2020 (SCI-Expanded)
- XII. **Nontraditional Attitude Filtering with Simultaneous Process and Measurement Covariance Adaptation**
Hacızade C., Soken H. E., Cilden-Guler D.
JOURNAL OF AEROSPACE ENGINEERING, vol.32, no.5, 2019 (SCI-Expanded)
- XIII. **A survey of calibration algorithms for small satellite magnetometers**
Soken H. E.
MEASUREMENT, vol.122, pp.417-423, 2018 (SCI-Expanded)
- XIV. **Exploration of energization and radiation in geospace (ERG): challenges, development, and operation of satellite systems**
Nakamura Y., Fukuda S., Shibano Y., Ogawa H., Sakai S., Shimizu S., Soken E., Miyazawa Y., Toyota H., Kukita A., et al.
EARTH PLANETS AND SPACE, vol.70, 2018 (SCI-Expanded)
- XV. **An Attitude Filtering and Magnetometer Calibration Approach for Nanosatellites**
Soken H. E.
INTERNATIONAL JOURNAL OF AERONAUTICAL AND SPACE SCIENCES, vol.19, no.1, pp.164-171, 2018 (SCI-Expanded)
- XVI. **Real-Time Attitude-Independent Magnetometer Bias Estimation for Spinning Spacecraft**
Soken H. E., Sakai S.
JOURNAL OF GUIDANCE CONTROL AND DYNAMICS, vol.41, no.1, pp.276-279, 2018 (SCI-Expanded)
- XVII. **NANOSATELLITE ATTITUDE ESTIMATION FROM VECTOR MEASUREMENTS USING SVD-AIDED UKF ALGORITHM**
Cilden D., Soken H. E., Hacızade C.
METROLOGY AND MEASUREMENT SYSTEMS, vol.24, no.1, pp.113-125, 2017 (SCI-Expanded)
- XVIII. **Small satellite attitude determination during plasma brake deorbiting experiment**

- Khurshid O., Selkainaho J., Soken H. E., Kallio E., Visala A.
ACTA ASTRONAUTICA, vol.129, pp.52-58, 2016 (SCI-Expanded)
- XIX. **Adaptive Tuning of the Unscented Kalman Filter for Satellite Attitude Estimation**
Soken H. E., Sakai S.
JOURNAL OF AEROSPACE ENGINEERING, vol.28, no.3, 2015 (SCI-Expanded)
- XX. **In-Orbit Estimation of Time-Varying Residual Magnetic Moment**
Soken H. E., Sakai S., Wisniewski R.
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, vol.50, no.4, pp.3126-3136, 2014 (SCI-Expanded)
- XXI. **REKF and RUKF for pico satellite attitude estimation in the presence of measurement faults**
Soeken H. E., Hacızade C.
JOURNAL OF SYSTEMS ENGINEERING AND ELECTRONICS, vol.25, no.2, pp.288-297, 2014 (SCI-Expanded)
- XXII. **Robust Kalman filtering for small satellite attitude estimation in the presence of measurement faults**
Soken H. E., Hacızade C., Sakai S.
EUROPEAN JOURNAL OF CONTROL, vol.20, no.2, pp.64-72, 2014 (SCI-Expanded)
- XXIII. **Robust adaptive unscented Kalman filter for attitude estimation of pico satellites**
Hacızade C., Soken H. E.
INTERNATIONAL JOURNAL OF ADAPTIVE CONTROL AND SIGNAL PROCESSING, vol.28, no.2, pp.107-120, 2014 (SCI-Expanded)
- XXIV. **Adaptive Fading UKF with Q-Adaptation: Application to Picosatellite Attitude Estimation**
Soken H. E., Hacızade C.
JOURNAL OF AEROSPACE ENGINEERING, vol.26, no.3, pp.628-636, 2013 (SCI-Expanded)
- XXV. **Robust Adaptive Kalman Filter for estimation of UAV dynamics in the presence of sensor/actuator faults**
Hacızade C., Soken H. E.
AEROSPACE SCIENCE AND TECHNOLOGY, vol.28, no.1, pp.376-383, 2013 (SCI-Expanded)
- XXVI. **UKF-Based Reconfigurable Attitude Parameters Estimation and Magnetometer Calibration**
Soken H. E., Hacızade C.
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, vol.48, no.3, pp.2614-2627, 2012 (SCI-Expanded)
- XXVII. **UKF based in-flight calibration of magnetometers and rate gyros for pico satellite attitude determination**
Soeken H. E., Hacızade C.
ASIAN JOURNAL OF CONTROL, vol.14, no.3, pp.707-715, 2012 (SCI-Expanded)
- XXVIII. **Robust Estimation of UAV Dynamics in the Presence of Measurement Faults**
Hacızade C., Soken H. E.
JOURNAL OF AEROSPACE ENGINEERING, vol.25, no.1, pp.80-89, 2012 (SCI-Expanded)
- XXIX. **Pico satellite attitude estimation via Robust Unscented Kalman Filter in the presence of measurement faults**
Soken H. E., Hacızade C.
ISA TRANSACTIONS, vol.49, no.3, pp.249-256, 2010 (SCI-Expanded)

Articles Published in Other Journals

- I. **Angular Velocity Estimation for Nanosatellites Using Vector Measurements**
SÖKEN H. E.
Journal of Aeronautics and Space Technologies, vol.14, no.2, pp.221-228, 2021 (Peer-Reviewed Journal)
- II. **Estimation of pico-satellite attitude dynamics and external torques via Unscented Kalman Filter**
Söken H. E., Hajiyev C.
Journal of Aerospace Technology and Management, vol.6, no.2, pp.149-157, 2014 (ESCI)

- III. **In-flight calibration of pico satellite attitude sensors via unscented kalman filter**
SÖKEN H. E., Hajiyeve C.
Gyroscopy and Navigation, vol.2, no.3, pp.156-163, 2011 (Scopus)
- IV. **Reconfigurable UKF for in-flight magnetometer calibration and attitude parameter estimation**
SÖKEN H. E., Hajiyeve C.
IFAC Proceedings Volumes (IFAC-PapersOnline), vol.44, pp.741-746, 2011 (Scopus)

Books & Book Chapters

- I. **Fault Tolerant Attitude Estimation for Small Satellites**
Söken H. E., Hacızade C.
CRC, New York , Florida, 2021
- II. **Integration of Single-Frame and Filtering Methods for Nanosatellite Attitude Estimation**
Söken H. E., Hacızade C., Çilden Güler D.
in: Multisensor Attitude Estimation, Hassen Fourati,Djamel Eddine Chouaib Belkhiat, Editor, CRC, New York , Florida, pp.463-484, 2016
- III. **Fault Tolerant Estimation of UAV Dynamics via Robust Adaptive Kalman Filter**
Söken H. E., Hacızade C.
in: Complex Systems, Georgi M. Dimirovski, Editor, Springer, London/Berlin , Bern, pp.369-394, 2016
- IV. **State Estimation and Control for Low-cost Unmanned Aerial Vehicles**
Söken H. E., Hacızade C.
Springer, London/Berlin , Bern, 2015
- V. **Multiple-Model Adaptive Estimation of Time-Varying Residual Magnetic Moment for Small Satellites**
Söken H. E., Sakai S.
in: Advances in Aerospace Guidance, Navigation and Control, Joël Bordeneuve-Guibé,Antoine Drouin,Clément Roos, Editor, Springer, London/Berlin , Bern, pp.303-321, 2015
- VI. **Robust Kalman Filtering with Single and Multiple Scale Factors for Small Satellite Attitude Estimation**
Söken H. E., Hacızade C., Sakai S.
in: Advances in Estimation, Navigation, and Spacecraft Control, Daniel Choukroun,Yaakov Oshman,Julie Thienel,Moshe Idan, Editor, Springer, London/Berlin , Berlin, pp.391-411, 2015
- VII. **Robust Self-adaptive Kalman Filter with the R and Q Adaptations against Sensor/Actuator Failures**
Söken H. E., Hacızade C.
in: Self-organization: Theories and Methods, WenJun Zhang, Editor, NOVA Science Publishers Inc. , New York, pp.201-224, 2013

Refereed Congress / Symposium Publications in Proceedings

- I. **A Dual Quaternion Based Visual Odometry Method for a Lunar Lander**
Uzun S. S., SÖKEN H. E.
2024 IEEE Aerospace Conference, AERO 2024, Montana, United States Of America, 2 - 09 March 2024
- II. **Predictive Motion Planning for VTOL Landings on Vertically Moving Marine Platforms**
Kholosi H., Yayla M., Kutlu A., SÖKEN H. E.
2024 International Conference on Unmanned Aircraft Systems, ICUAS 2024, Chania, Crete, Greece, 4 - 07 June 2024, pp.480-487
- III. **Fault-tolerant ADCS for Small Satellites Using Bayesian Networks**
Yildirim C., SÖKEN H. E.
2024 IEEE Aerospace Conference, AERO 2024, Montana, United States Of America, 2 - 09 March 2024
- IV. **Robust Attitude Estimation Using Magnetic and Inertial Sensors**
Candan B., SÖKEN H. E.

22nd World Congress of the International Federation of Automatic Control (IFAC), Yokohama, Japan, 9 - 14 July 2023, pp.4502-4507

- V. **Visual aid for unmanned aircraft navigation in unknown environments**
Uzun S. S., Söken H. E.
12th International Conference on Innovation in Aviation and Space for Opening New Horizons, EASN 2022, Barcelona, Spain, 18 - 21 October 2022, vol.2526
- VI. **Analyzing the Effects of Visual Based Tracking Algorithms on Classical Guidance Methods**
Kurt Y., Aydinli S. U., Söken H. E.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023
- VII. **Quaternion Interpolation Under the Angular Velocity Constraint**
Gokce M., Gulmammadov F., Söken H. E., Sozen S. N.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023
- VIII. **IMECE Satellite Attitude and Orbit Control Subsystem - AOCs Overview**
Kahraman O., Koker A., Inaltekin B. B., Yurttagul B., Yaglioglu B., Yavuzylmaz C., Dag E., Kovan E. C., Söken H. E., Emri K. U., et al.
10th International Conference on Recent Advances in Air and Space Technologies (RAST), İstanbul, Turkey, 7 - 09 June 2023
- IX. **Performance Analysis of System Identification Techniques for a Rocket**
Bayri H. D., Söken H. E.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023
- X. **Design of a Guidance System for an Airlaunch Rocket Using Iterative Guidance Mode**
Yanik T., Söken H. E.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023
- XI. **Onboard Gyro Calibration for Small Satellites Using Star Tracker Measurements**
Akca O., Tirman K. E., Söken H. E.
10th International Conference on Recent Advances in Air and Space Technologies, RAST 2023, İstanbul, Turkey, 7 - 09 June 2023
- XII. **Vision-Based Real-Time Motion Estimation of Ground Vehicles from Aerial Imagery**
Kurt Y., Söken H. E.
12th International Conference on Innovation in Aviation and Space for Opening New Horizons, EASN 2022, Barcelona, Spain, 18 - 21 October 2022, vol.2526
- XIII. **A Model Predictive Control Based Magnetorquer-only Attitude Control Approach for a Small Satellite**
Eşit M., Söken H. E., Hajiyev C.
22nd IFAC Symposium on Automatic Control in Aerospace, ACA 2022 - Proceedings, Mumbai, India, 21 - 25 November 2022, vol.55, pp.79-84
- XIV. **Reducing the Computational Load of Attitude Estimation for Nano-Satellites using Integrated Measurements**
Benli D., SÖKEN H. E.
11th Nano Satellite Symposium, İstanbul, Turkey, 17 - 19 October 2022
- XV. **Design of a Visual Pose Estimation Algorithm for Moon Landing**
Süslü A., Kuran B. R., SÖKEN H. E.
11th Nano Satellite Symposium, İstanbul, Turkey, 17 October 2022
- XVI. **Attitude Determination for Nanosatellites Using Only a Set of Analog Sun Sensors**
Sözen Ş. N., GÖKCE M., SÖKEN H. E., Gulmammadov F.
33rd International Symposium on Space Technology and Science, Beppu, Japan, 26 February 2022
- XVII. **GYROLESS BACKUP ATTITUDE ESTIMATION ALGORITHM FOR NANOSATELLITES USING MAGNETIC FIELD DERIVATIVES IN THE LOSS OF SUN SENSOR MEASUREMENTS**

- YAKUPOĞLU Ş., Eşit M., HACIZADE C., SÖKEN H. E.
11th ANKARA INTERNATIONAL AEROSPACE CONFERENCE, 8 - 10 September 2021
- XVIII. **INVESTIGATION OF DIFFERENT APPROACHES FOR STAR IDENTIFICATION AND TRACKING IN LOW-COST STAR TRACKERS**
Açıkgöz A. E., Oksal E., Kaplan E., SÖKEN H. E.
11th ANKARA INTERNATIONAL AEROSPACE CONFERENCE, 8 - 10 September 2021
- XIX. **COVARIANCE-SCALING ROBUST ATTITUDE ESTIMATION USING INERTIAL MEASUREMENTS**
CANDAN B., SÖKEN H. E.
11th ANKARA INTERNATIONAL AEROSPACE CONFERENCE, 8 - 10 September 2021
- XX. **INS/ GNSS INTEGRATION FOR A GUIDED MUNITION WITH ERROR-STATE KALMAN FILTER**
Eroğlu N. S., SÖKEN H. E.
11th ANKARA INTERNATIONAL AEROSPACE CONFERENCE, 8 - 10 September 2021
- XXI. **PARAMETER ESTIMATION OF A MAGNETORQUER BY USING THE DIFFERENTIAL CORRECTOR**
Sözen Ş. N., GÖKCE M., Gulmammadov F., YAVUZYILMAZ Ç., SÖKEN H. E.
11th ANKARA INTERNATIONAL AEROSPACE CONFERENCE, 8 - 10 September 2021
- XXII. **Incorporating Delayed Star Tracker Measurements in Attitude Filter**
KAHRAMAN Ö., SÖKEN H. E.
2021 AAS/AIAA Astrodynamics Specialist Conference, United States Of America, 9 - 11 August 2021
- XXIII. **Aiding Coarse Attitude with Image-Based Three-Axis Attitude Measurements Using Multiplicative Extended Kalman Filter for Small Satellites**
GÜZEL M. B., SÖKEN H. E., TEKİNALP O.
2021 AAS/AIAA Astrodynamics Specialists Conference, United States Of America, 9 - 11 August 2021
- XXIV. **Estimation of attitude using robust adaptive kalman filter**
Candan B., SÖKEN H. E.
8th IEEE International Workshop on Metrology for AeroSpace, MetroAeroSpace 2021, Virtual, Online, 22 - 25 June 2021, pp.159-163
- XXV. **Measurement correction of a set of analog sun sensors via neural network**
Sozen S. N., Gokce M., Yavuzylmaz C., Gulmammadov F., SÖKEN H. E.
8th IEEE International Workshop on Metrology for AeroSpace, MetroAeroSpace 2021, Virtual, Online, 22 - 25 June 2021, pp.19-24
- XXVI. **Image Based Attitude Determination Algorithm for Small Satellites: Design and Preliminary Results**
SÖKEN H. E., GÜZEL M. B., TEKİNALP O.
International Astronautical Federation, 2020 International Astronautical Congress, Dubai, Sanal Yapıldı, United Arab Emirates, 12 - 14 October 2020
- XXVII. **FIRDÖNDÜ UYDULAR İÇİN SÖZLE ÖLÇÜMLER KULLANARAK YÖNELİM BAĞIMSIZ GERÇEK ZAMANLI MANYETOMETRE KALİBRASYONU**
Çetin M. E., Söken H. E., Tekinalp O.
8. Ulusal Havacılık ve Uzay Konferansı, Ankara, Turkey, 9 - 11 September 2020, pp.1-8
- XXVIII. **BİR YER GÖZLEM UYDUSU İÇİN YÖNELİM DİNAMİĞİ PARAMETRELERİNİN TASARIM KISITLARI DAHİLİNDE KESTİRİMİ**
Sözen Ş. N., Gökçe M., Söken H. E., Gulmammadov F.
8. ULUSAL HAVACILIK ve UZAY KONFERANSI, 9 - 11 September 2020, pp.1-8
- XXIX. **BİR ALÇAK YÖRÜNGE UYDUSU İÇİN KUATERNİYON GERİBESLEMELİ REGÜLATÖR VE DOĞRUSAL KUADRATİK REGÜLATÖR TASARIMI**
Eşit M., Yakupoğlu Ş., Uçun L., Söken H. E., Gulmammadov F.
8.ULUSAL HAVACILIK ve UZAY KONFERANSI, Ankara, Turkey, 9 - 11 September 2020, pp.1-12
- XXX. **Türkiye Bölgesel Seyrüsefer Uydu Sisteminin Bir Artırım Sistemi Olarak Tasarımı ve Eniyilemesi**
Tuğcular U., Başbüyük A. C., Engin M. F., Şişman T. Ç., Tola C., Söken H. E.
8. Ulusal Havacılık ve Uzay Konferansı, Ankara, Turkey, 09 September 2020 - 11 October 2021, pp.1-16
- XXXI. **KÜÇÜK UYDULARDA YÖNELİM BELİRLEME FİLTRESİNİN KAMERA TABANLI ÖLÇÜMLER İLE DESTEKLENMESİ**

- Söken H. E., Güzel M. B., Tekinalp O.
8. ULUSAL HAVACILIK VE UZAY KONFERANSI, Ankara, Turkey, 9 - 11 September 2020, pp.1-13
- XXXII. **ATALETSEL SENSÖRLER KULLANARAK YÖNELİM BELİRLEMEDE FARKLI FİLTRE ALGORİTMALARININ KARŞILAŞTIRILMASI**
Söken H. E., Candan B.
8. ULUSAL HAVACILIK ve UZAY KONFERANSI, Ankara, Turkey, 9 - 11 September 2020, pp.1-14
- XXXIII. **Attitude-Independent Magnetometer Calibration for Spinning Spacecraft Using Quasi-Measurements**
Söken H. E., Çetin M. E., Sakai S.
2020 AAS/AIAA Astrodynamics Specialist Conference, California, United States Of America, 9 - 12 August 2020, pp.1-16
- XXXIV. **Imaging-based attitude determination algorithm for small satellites: Design and the preliminary results**
Güzel M. B., Söken H. E., Tekinalp O.
71st International Astronautical Congress, IAC 2020, Virtual, Online, 12 - 14 October 2020, vol.2020-October
- XXXV. **Mission Experience for Spinning Spacecraft Attitude Filtering with Spin Parameters**
Söken H. E., Sakai S., Asamura K., Nakamura Y., Takashima T., Shinohara I.
32nd International Symposium on Space Technology and Science, Fukui, Japan, 17 - 21 June 2019, pp.1-8
- XXXVI. **Tuning the attitude filter: A comparison of intuitive and adaptive approaches**
SÖKEN H. E., Hacızade C.
9th International Conference on Recent Advances in Space Technologies, RAST 2019, İstanbul, Turkey, 11 - 14 June 2019, pp.747-752
- XXXVII. **TRIAD+Filtering approach for complete magnetometer calibration**
Söken H. E., Sakai S.
9th International Conference on Recent Advances in Space Technologies, RAST 2019, İstanbul, Turkey, 11 - 14 June 2019, pp.703-708
- XXXVIII. **Advanced attitude determination algorithm for arase: Preliminary mission experience**
SÖKEN H. E., Sakai S., Asamura K., Nakamura Y., Takashima T.
AAS/AIAA Astrodynamics Specialist Conference, 2017, Washington, United States Of America, 20 - 24 August 2017, vol.162, pp.1175-1193
- XXXIX. **Pseudo-Linear Kalman Filter for Attitude Estimation of a Spinning Nanosatellite**
Söken H. E., Khurshid O., Kallio E., Visala A., Selkainaho J.
8th Nano-satellite Symposium, Matsuyama, Japan, 3 - 09 June 2017, pp.1-6
- XL. **Non-Traditional Robust UKF against Attitude Sensors Faults**
Söken H. E., Hacızade C., Çilden Güler D.
26th International Symposium on Space Flight Dynamics, Matsuyama, Japan, 3 - 09 June 2017, pp.1-6
- XLI. **Spinning Spacecraft Attitude Filtering with Spin Parameters: Performance Evaluation with Real Data**
Söken H. E., Sakai S., Van Der Ha J. C.
26th International Symposium on Space Flight Dynamics, Matsuyama, Japan, 3 - 09 June 2017, pp.1-6
- XLII. **Study on an Advanced Attitude Determination Algorithm for the ERG Spacecraft**
Söken H. E., Sakai S., Asamura K., Nakamura Y., Takashima T.
26th International Symposium on Space Flight Dynamics, Matsuyama, Japan, 3 - 09 June 2017, pp.1-6
- XLIII. **A Survey of Calibration Algorithms for Small Satellite Magnetometers**
Soken H. E.
4th IEEE International Workshop on Metrology for AeroSpace, Padua, Italy, 21 - 23 June 2017, pp.62-67
- XLIV. **Pseudo-Linear Approach to Nanosatellite Attitude Estimation and Magnetometer Calibration**
Khurshid O., Selkainaho J., Kallio E., Visala A., Soken H. E.
8th International Conference on Recent Advances in Space Technologies (RAST), İstanbul, Turkey, 19 - 22 June 2017, pp.355-360
- XLV. **Spin-axis tilt estimation algorithm with validation by real data**
SÖKEN H. E., Van Der Ha J. C., Sakai S.
27th AAS/AIAA Space Flight Mechanics Meeting, 2017, Texas, United States Of America, 5 - 09 February 2017,

vol.160, pp.2631-2645

- XLVI. **Nontraditional UKF Based Nanosatellite Attitude Estimation with the Process and Measurement Noise Covariances Adaptation**
Hacızade C., Guler D. C., Soken H. E.
8th International Conference on Recent Advances in Space Technologies (RAST), İstanbul, Turkey, 19 - 22 June 2017, pp.381-386
- XLVII. **IAC-17.C1.1.3: Time-varying errors for magnetometers on small satellites**
SÖKEN H. E., Sakai S.
68th International Astronautical Congress: Unlocking Imagination, Fostering Innovation and Strengthening Security, IAC 2017, Adelaide, Australia, 25 - 29 September 2017, vol.10, pp.6809-6815
- XLVIII. **Spin parameters and nonlinear kalman filtering for spinning spacecraft attitude estimation**
SÖKEN H. E., Sakai S., Asamura K., Nakamura Y., Takashima T.
27th AAS/AIAA Space Flight Mechanics Meeting, 2017, Texas, United States Of America, 5 - 09 February 2017, vol.160, pp.2615-2629
- XLIX. **Magnetometer Only Attitude Estimation for Spinning Small Satellites**
Soken H. E., Sakai S.
8th International Conference on Recent Advances in Space Technologies (RAST), İstanbul, Turkey, 19 - 22 June 2017, pp.369-374
- L. **Q-Adaptation of SVD-aided UKF Algorithm for Nanosatellite Attitude Estimation**
Hacızade C., Soken H. E., Guler D. C.
20th World Congress of the International-Federation-of-Automatic-Control (IFAC), Toulouse, France, 9 - 14 July 2017, vol.50, pp.8273-8278
- LI. **Multiple Model Adaptive Estimation Algorithm for Systems with Parameter Change**
Soken H. E., Sakai S.
55th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE), Tsukuba, Japan, 20 - 23 September 2016, pp.1718-1723
- LII. **Spin-axis tilt estimation for spinning spacecraft**
Söken H. E., Sakai S., Asamura K., Nakamura Y., Takashima T.
AIAA Guidance, Navigation, and Control Conference, 2016, California, United States Of America, 4 - 08 January 2016
- LIII. **1Attitude Estimation for Nanosatellites Using Singular Value Decomposition and Unscented Kalman Filter**
Söken H. E., Hacızade C., Çilden Güler D.
30th International Symposium on Space Technology and Science, Kobe, Japan, 3 - 10 July 2015, pp.1-6
- LIV. **Magnetometer Calibration for Advanced Small Satellite Missions**
Söken H. E., Sakai S.
30th International Symposium on Space Technology and Science, Kobe, Japan, 3 - 10 July 2015, pp.1-6
- LV. **Investigation of Estimation Methods for Time-varying Residual Magnetic Moment**
Soken H. E., Sakai S.
Asia-Pacific International Symposium on Aerospace Technology (APISAT), Shanghai, China, 24 - 26 September 2014, vol.99, pp.1146-1151
- LVI. **Attitude and Attitude Rate Estimation for a Nanosatellite Using SVD and UKF**
Cilden D., Hacızade C., Soken H. E.
7th International Conference on Recent Advances in Space Technologies (RAST), İstanbul, Turkey, 16 - 19 June 2015, pp.695-700
- LVII. **Simultaneous adaptation of the process and measurement noise covariances for the UKF applied to nanosatellite attitude estimation**
Söken H. E., Hacızade C., Sakai S.
19th IFAC World Congress on International Federation of Automatic Control, IFAC 2014, Cape-Town, South Africa, 24 - 29 August 2014, vol.19, pp.5921-5926
- LVIII. **In-orbit estimation of time-varying residual magnetic moment for small satellite applications**

Söken H. E., Sakai S.

AIAA Guidance, Navigation, and Control (GNC) Conference, Boston, MA, United States Of America, 19 - 22 August 2013

- LIX. **Residual based Adaptive Unscented Kalman filter for satellite attitude estimation**
SÖKEN H. E., Sakai S.
AIAA Guidance, Navigation, and Control Conference 2012, Minneapolis, MN, United States Of America, 13 - 16 August 2012
- LX. **Fault tolerant attitude estimation for pico satellites using robust adaptive UKF**
SÖKEN H. E., Hajiyev C.
8th IFAC Symposium on Fault Detection, Supervision and Safety of Technical Processes, SAFEPROCESS 2012, Mexico City, Mexico, 29 - 31 August 2012, vol.8, pp.726-731
- LXI. **Fault tolerant estimation of autonomous underwater vehicle dynamics via robust UKF**
Hajiyev C., Ata M., Dinc M., SÖKEN H. E.
2012 13th International Carpathian Control Conference, ICCO 2012, High Tatras, Slovakia, 28 - 31 May 2012, pp.203-208
- LXII. **UKF based on-orbit gyro and magnetometer bias estimation as a part of the attitude determination procedure for a small satellite**
SÖKEN H. E., Sakai S.
2011 11th International Conference on Control, Automation and Systems, ICCAS 2011, Gyeonggi-do, South Korea, 26 - 29 October 2011, pp.1891-1896
- LXIII. **A novel adaptive unscented Kalman filter for pico satellite attitude estimation**
Söken H. E., Hacızade C.
Physics Congress, Leon, Spain, 5 - 08 September 2011, pp.1-7
- LXIV. **In flight magnetometer calibration via unscented Kalman filter**
SÖKEN H. E., Hajiyev C.
5th International Conference on Recent Advances in Space Technologies, RAST 2011, İstanbul, Turkey, 9 - 11 June 2011, pp.885-890
- LXV. **REKF and RUKF development for pico satellite attitude estimation in the presence of measurement faults**
SÖKEN H. E., Hajiyev C.
5th International Conference on Recent Advances in Space Technologies, RAST 2011, İstanbul, Turkey, 9 - 11 June 2011, pp.891-896
- LXVI. **UKF based in-flight calibration of magnetometers and rate gyros for pico satellite attitude determination**
SÖKEN H. E., Hajiyev C.
17th Saint Petersburg International Conference on Integrated Navigation Systems, ICINS 2010, Saint Petersburg, Russia, 31 May - 02 June 2010, pp.233-240
- LXVII. **Adaptive Kalman filter with multiple fading factors for UAV state estimation**
Hajiyev C., SÖKEN H. E.
7th IFAC International Symposium on Fault Detection, Supervision and Safety of Technical Systems, SAFEPROCESS'09, Barcelona, Spain, 30 June - 03 July 2009, pp.77-82
- LXVIII. **Adaptive Unscented Kalman Filter with Multiple Fading Factors for Pico Satellite Attitude Estimation**
Soken H. E., Hacızade C.
4th International Conference on Recent Advances in Space Technologies, İstanbul, Turkey, 11 - 13 June 2009, pp.541-546
- LXIX. **Adaptive Kalman Filter with the Filter Gain Correction Applied to UAV Flight Dynamics**
Hacızade C., Soken H. E.
17th Mediterranean Conference on Control and Automation, Thessaloniki, Greece, 24 - 26 June 2009, pp.892-897
- LXX. **UKF for the Identification of the Pico Satellite Attitude Dynamics Parameters and the External Torques on IMU and Magnetometer Measurements**
Soken H. E., Hacızade C.

Supported Projects

Söken H. E., Asia Pasific Space Cooperation Organization (APSCO) Supported Project, TR-METUCube, 2023 - 2025
Özgen S., Konukseven E. I., Güloğlu G. E., Söken H. E., Yaman Y., Kayran A., Technopark, Very Light Uçak (VLA)
Geliştirilmesine Yönelik Bağımsız Araştırma-Geliştirme Projesi, 2023 - 2024

Activities in Scientific Journals

Committee Member, 2023 - Continues
IEEE Access, Assistant Editor/Section Editor, 2017 - Continues

Memberships / Tasks in Scientific Organizations

IEEE Control Systems Society Membership, Member, 2023 - Continues, United States Of America
Uzay Teknolojileri ve Eğitimi Derneği, Member, 2021 - Continues, Turkey
IEEE Aerospace and Electronic Systems Society, Member, 2021 - Continues, United States Of America
American Institute of Aeronautics and Astronautics (AIAA), Member, 2012 - Continues, United States Of America
Institute of Electrical and Electronics Engineers (IEEE), Member, 2011 - Continues, United States Of America

Scientific Refereeing

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, December 2023
IEEE ACCESS, SCI Journal, November 2023
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, SCI Journal, October 2023
EUROPEAN PHYSICAL JOURNAL: SPECIAL TOPICS, SCI Journal, October 2023
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, SCI Journal, August 2023
AERONAUTICAL JOURNAL, SCI Journal, August 2023
EUROPEAN PHYSICAL JOURNAL: SPECIAL TOPICS, SCI Journal, August 2023
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, August 2023
EUROPEAN PHYSICAL JOURNAL: SPECIAL TOPICS, SCI Journal, May 2023
IEEE ACCESS, SCI Journal, May 2023
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, April 2023
IEEE ACCESS, SCI Journal, April 2023
ADVANCES IN SPACE RESEARCH, SCI Journal, March 2023
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, SCI Journal, February 2023
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, January 2023
IEEE TRANSACTIONS ON SIGNAL PROCESSING, Journal Indexed in SSCI, December 2022
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, Journal Indexed in SSCI, November 2022
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, Journal Indexed in SSCI, October 2022
IEEE Transactions on Intelligent Vehicles, Journal Indexed in SSCI, October 2022
IEEE/ASME TRANSACTIONS ON MECHATRONICS, Journal Indexed in SSCI, October 2022
IEEE TRANSACTIONS ON SIGNAL PROCESSING, Journal Indexed in SSCI, September 2022
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, Journal Indexed in SSCI, August 2022
IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, July 2022
IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, Journal Indexed in SSCI, June 2022

IEEE ACCESS, Journal Indexed in SSCI, May 2022

IEEE TRANSACTIONS ON SIGNAL PROCESSING, Journal Indexed in SSCI, May 2022

IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, SCI Journal, May 2022

IEEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE, SCI Journal, April 2022

IEEE ACCESS, SCI Journal, April 2022

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, April 2022

IEEE ACCESS, SCI Journal, March 2022

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, March 2022

IEEE MAGNETICS LETTERS, Journal Indexed in SSCI, February 2022

IEEE MAGNETICS LETTERS, Journal Indexed in SSCI, January 2022

IEEE ACCESS, SCI Journal, December 2021

IEEE MAGNETICS LETTERS, SCI Journal, November 2021

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, November 2021

IEEE TRANSACTIONS ON MAGNETICS, SCI Journal, November 2021

SENSORS, SCI Journal, October 2021

AIAA JOURNAL, SCI Journal, October 2021

Drone Systems and applications , Journal Indexed in ESCI, October 2021

IEEE ACCESS, SCI Journal, September 2021

IEEE ACCESS, SCI Journal, September 2021

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, September 2021

IEEE ACCESS, SCI Journal, September 2021

TUBITAK Project, 2209-A - Üniversite Öğrencileri Araştırma Projeleri Destekleme Programı, Middle East Technical University, Turkey, September 2021

AEROSPACE SCIENCE AND TECHNOLOGY, SCI Journal, August 2021

JOURNAL OF APPLIED RESEARCH AND TECHNOLOGY, Other Indexed Journal, August 2021

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, August 2021

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, July 2021

IEEE TRANSACTIONS ON MAGNETICS, SCI Journal, May 2021

IET RADAR SONAR AND NAVIGATION, SCI Journal, April 2021

IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS, SCI Journal, March 2021

IEEE Sensors Letters, Journal Indexed in ESCI, March 2021

Electronics Letters, SCI Journal, February 2021

IEEE ACCESS, SCI Journal, February 2021

MEASUREMENT, SCI Journal, January 2021

IET RADAR SONAR AND NAVIGATION, Journal Indexed in SCI-E, November 2020

IEEE ACCESS, Journal Indexed in SCI-E, October 2020

IEEE Access, Journal Indexed in SCI-E, October 2020

IEEE SENSORS JOURNAL, Journal Indexed in SCI-E, July 2020

IEEE Transactions On Automation Science And Engineering, SCI Journal, July 2020

AEROSPACE SCIENCE AND TECHNOLOGY, SCI Journal, June 2020

IEEE SENSORS JOURNAL, SCI Journal, May 2020

IEEE ACCESS, SCI Journal, April 2020

IEEE Access, SCI Journal, April 2020

Journal of Aerospace Information Systems, Other Indexed Journal, April 2020

AEROSPACE SCIENCE AND TECHNOLOGY, SCI Journal, April 2020

AEROSPACE SCIENCE AND TECHNOLOGY, SCI Journal, March 2020

MEASUREMENT, SCI Journal, March 2020

IEEE ACCESS, SCI Journal, March 2020

IEEE SENSORS JOURNAL, SCI Journal, February 2020

IEEE ACCESS, National Scientific Refreed Journal, February 2020

IEEE ACCESS, SCI Journal, February 2020

Scientific Consultations

Tübitak Uzay Teknolojileri Araştırma Enstitüsü, Scientific Consultancy, Middle East Technical University, Faculty of Engineering, Department of Aerospace Engineering, Turkey, 2021 - Continues

Tasks In Event Organizations

Söken H. E., Recent Advances in Space Technologies, Scientific Congress, İstanbul, Turkey, Haziran 2019

Söken H. E., Recent Advances in Space Technologies, Scientific Congress, İstanbul, Turkey, Haziran 2017

Söken H. E., Recent Advances in Space Technologies, Scientific Congress, İstanbul, Turkey, Haziran 2015

Metrics

Publication: 115

Citation (WoS): 673

Citation (Scopus): 977

H-Index (WoS): 14

H-Index (Scopus): 16

Congress and Symposium Activities

Otomatik Kontrol Türk Milli Komitesi Ulusal Kongresi, Panelists, Van, Turkey, 2021

Invited Talks

Fault-tolerant Attitude Determination and Control System Design for Small Satellites, Seminar, Türk Hava Kurumu Üniversitesi, Turkey, March 2023

Attitude Determination and Control for Small Satellites: A Review in the Perspective of Recent Problems, Seminar, Türk Hava Kurumu Üniversitesi, Turkey, March 2020

Scholarships

MEXT, Official Institutions of Foreign Countries, 2010 - 2013

2211 Yurt İçi Lisansüstü Burs Programı, TÜBİTAK, 2007 - 2009

Representation and Promotion Activities

Institutional Representation, TC Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı, Turkey, Ankara, 2022 - 2023

Non Academic Experience

TÜBİTAK, Tubitak Space Technologies Research Institute

TÜBİTAK Uzay Teknolojileri Araştırma Enstitüsü

Other, Japan Aerospace Exploration Agency

Other, Japan Aerospace Exploration Agency

Japan Aerospace Exploration Agency

Japan Aerospace Exploration Agency