

Doç.Dr. Tufan Kumbasar

Kişisel Bilgiler

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Biyografi

TUFAN KUMBASAR is an Associate Professor in the Department of Control and Automation and the Vice Dean of Faculty of Electrical and Electronics Engineering, Istanbul Technical University, Turkey. He is also the director of the Artificial Intelligence and Intelligent Systems (AI2S) Laboratory at the Istanbul Technical University. His major research interests are in computational intelligence, notably type-2 fuzzy systems, fuzzy logic, neural networks, evolutionary algorithms and control theory. Dr. Kumbasar is also interested in process control, robotics and intelligent control and their real-world applications. His major research interests are in computational intelligence, notably type-2 fuzzy systems, fuzzy control, neural networks, evolutionary algorithms and control theory. He is also interested in process control, robotics, intelligent control and their real-world applications. Dr. Kumbasar has currently authored more than 100 peer-reviewed papers in international journals, conferences and book chapters. Dr. Kumbasar received the Best Paper Award from the IEEE International Conference on Fuzzy Systems in 2015 and from the 6th International Conference on Control Engineering & Information Technology. He has participated in leading positions in many national and international projects as principal, main investigator, researcher and academic consultant. He also works as a peer reviewer for more than 40 international journals such as IEEE Transactions on Fuzzy Systems, IEEE Transaction on Industrial Electronics and Applied Soft Computing. Dr. Kumbasar has been an Associate Editor for the IEEE Transactions on Fuzzy Systems and Area Editor for the International Journal of Approximate Reasoning. He has also served as a Publication Co-Chair, Panel Session Co-Chair, Special Session Co-Chair, PC, IPC and TPC in various international and national conferences.

Eğitim Bilgileri

Doktora, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Kontrol Ve Otomasyon Mühendisliği (Dr), Türkiye 2008 - 2012

Yüksek Lisans, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Kontrol Ve Otomasyon Mühendisliği (YI) (Tezli), Türkiye 2006 - 2008

Lisans, İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, Kontrol Ve Otomasyon Mühendisliği Bölümü, Türkiye 2002 - 2006

Yabancı Diller

İngilizce

Yaptığı Tezler

Doktora, Type-2 fuzzy model inversion methods and fuzzy model based controller design, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Kontrol Ve Otomasyon Mühendisliği (Dr), 2012

Yüksek Lisans, Ters bulanık model alma yöntemleri, İstanbul Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Kontrol Ve Otomasyon Mühendisliği (YI) (Tezli), 2008

Araştırma Alanları

Bilgi Sistemleri, Haberleşme ve Kontrol Mühendisliği, Kontrol ve Sistem Mühendisliği, Denetleyiciler , Optimal Kontrol , Robotik ve Mekatronik Sistemler, Akıllı Etmenler, Mühendislik ve Teknoloji

Akademik Unvanlar / Görevler

Doç.Dr., İstanbul Teknik Üniversitesi, Elektrik-Elektronik, Kontrol Ve Otomasyon Mühendisliği, 2018 - Devam Ediyor
Yrd.Doç.Dr., İstanbul Teknik Üniversitesi, Elektrik-Elektronik, Kontrol Ve Otomasyon Mühendisliği, 2014 - 2018
Araştırma Görevlisi, İstanbul Teknik Üniversitesi, Elektrik-Elektronik, Kontrol Ve Otomasyon Mühendisliği, 2007 - 2014

Akademik İdari Deneyim

İstanbul Teknik Üniversitesi, 2017 - Devam Ediyor
İstanbul Teknik Üniversitesi, Elektrik-Elektronik Fakültesi, Kontrol Ve Otomasyon Mühendisliği Bölümü, 2016 - Devam Ediyor

Verdiği Dersler

OTOMATİK KONTROL SİSTEMLERİ, Lisans, 2016 - 2017
PROCESS CONTROL, Lisans, 2014 - 2015, 2015 - 2016, 2016 - 2017

SCI, SSCI ve AHCI İndekslerine Giren Dergilerde Yayınlanan Makaleler

- I. **Deep learning frameworks to learn prediction and simulation focused control system models**
Tuna T., Beke A., Kumbasar T.
APPLIED INTELLIGENCE, 2021 (SCI İndekslerine Giren Dergi)
- II. **Towards Systematic Design of General Type-2 Fuzzy Logic Controllers: Analysis, Interpretation, and Tuning**
Sakalli A., Kumbasar T., Mendel J. M.
IEEE TRANSACTIONS ON FUZZY SYSTEMS, cilt.29, sa.2, ss.226-239, 2021 (SCI İndekslerine Giren Dergi)
- III. **Interval Type-2 Fuzzy Cognitive Map-Based Flight Control System for Quadcopters**
Amirkhani A., Shirzadeh M., Kumbasar T.
INTERNATIONAL JOURNAL OF FUZZY SYSTEMS, cilt.22, sa.8, ss.2504-2520, 2020 (SCI İndekslerine Giren Dergi)
- IV. **A new fractional-order general type-2 fuzzy predictive control system and its application for glucose level regulation**
Mohammadzadeh A., Kumbasar T.
APPLIED SOFT COMPUTING, cilt.91, 2020 (SCI İndekslerine Giren Dergi)
- V. **Optimal PID control of spatial inverted pendulum with big bang-big crunch optimization**
Wang J., Kumbasar T.
IEEE-CAA JOURNAL OF AUTOMATICA SINICA, cilt.7, sa.3, ss.822-832, 2020 (SCI İndekslerine Giren Dergi)
- VI. **Adaptive backstepping controller design for MIMO cancer immunotherapy using Laguerre polynomials**
Zirkohi M. M. , Kumbasar T.
JOURNAL OF THE FRANKLIN INSTITUTE-ENGINEERING AND APPLIED MATHEMATICS, cilt.357, sa.8, ss.4664-4679, 2020 (SCI İndekslerine Giren Dergi)
- VII. **Design and development of FOLLY: A self-foldable and self-deployable quadcopter**
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- VIII. **Type-2 Fuzzy Logic-Based Linguistic Pursuing Strategy Design and Its Deployment to a Real-World Pursuit Evasion Game**
Beke A., Kumbasar T.
IEEE TRANSACTIONS ON CYBERNETICS, cilt.50, sa.1, ss.211-221, 2020 (SCI İndekslerine Giren Dergi)
- IX. **A Deep Learning-Based Pipeline for Teaching Control Theory: Transforming Feedback Control Systems on Whiteboard Into MATLAB**
Erdem D., Beke A., Kumbasar T.
IEEE ACCESS, cilt.8, ss.84631-84641, 2020 (SCI İndekslerine Giren Dergi)
- X. **A fuzzy logic-based autonomous car control system for the JavaScript Racer game**
Etlik U. B. , Korkmaz B., Beke A., Kumbasar T.
TRANSACTIONS OF THE INSTITUTE OF MEASUREMENT AND CONTROL, 2019 (SCI İndekslerine Giren Dergi)
- XI. **Learning with Type-2 Fuzzy activation functions to improve the performance of Deep Neural Networks**
Beke A., Kumbasar T.
ENGINEERING APPLICATIONS OF ARTIFICIAL INTELLIGENCE, cilt.85, ss.372-384, 2019 (SCI İndekslerine Giren Dergi)
- XII. **Current development on using Rotary Inverted Pendulum as a benchmark for testing linear and nonlinear control algorithms**
Hamza M. F. , Yap H. J. , Choudhury I. A. , Isa A. I. , Zimit A. Y. , Kumbasar T.
MECHANICAL SYSTEMS AND SIGNAL PROCESSING, cilt.116, ss.347-369, 2019 (SCI İndekslerine Giren Dergi)
- XIII. **Big Bang-Big Crunch optimized hierarchical sliding-mode control of X-Z inverted pendulum**
Wang J., Kumbasar T.
SIMULATION MODELLING PRACTICE AND THEORY, cilt.86, ss.25-35, 2018 (SCI İndekslerine Giren Dergi)
- XIV. **A survey on advancement of hybrid type 2 fuzzy sliding mode control**
HAMZA M. F. , YAP H. J. , CHOUDHURY I. A. , CHİROMA H., Kumbasar T.
NEURAL COMPUTING & APPLICATIONS, cilt.30, sa.2, ss.331-353, 2018 (SCI İndekslerine Giren Dergi)
- XV. **Type-2 Fuzzy Logic Controllers Made Even Simpler: From Design to Deployment for UAVs**
Sarabakha A., Fu C., Kayacan E., Kumbasar T.
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- XVI. **An inverse controller design method for interval type-2 fuzzy models**
Kumbasar T., EKSİN İ., GÜZELKAYA M., Yesil E.
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- XVII. **HYBRID ADAPTIVE TYPE-2 FUZZY TRACKING CONTROL OF CHAOTIC OSCILLATION DAMPING OF POWER SYSTEMS**
Zirkohi M. M. , Kumbasar T., Lin T.
ASIAN JOURNAL OF CONTROL, cilt.19, sa.3, ss.1114-1125, 2017 (SCI İndekslerine Giren Dergi)
- XVIII. **Revisiting Karnik-Mendel Algorithms in the framework of Linear Fractional Programming**
Kumbasar T.
INTERNATIONAL JOURNAL OF APPROXIMATE REASONING, cilt.82, ss.1-21, 2017 (SCI İndekslerine Giren Dergi)
- XIX. **Book review**
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FUZZY SETS AND SYSTEMS, cilt.306, ss.169-170, 2017 (SCI Expanded İndekslerine Giren Dergi)
- XX. **Robust Stability Analysis and Systematic Design of Single-Input Interval Type-2 Fuzzy Logic Controllers**
Kumbasar T.
IEEE TRANSACTIONS ON FUZZY SYSTEMS, cilt.24, sa.3, ss.675-694, 2016 (SCI İndekslerine Giren Dergi)
- XXI. **A Self-Tuning zSlices-Based General Type-2 Fuzzy PI Controller**
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SOFT COMPUTING, cilt.19, sa.5, ss.1283-1293, 2015 (SCI İndekslerine Giren Dergi)
- XXIII. **Big Bang-Big Crunch optimization based interval type-2 fuzzy PID cascade controller design strategy**
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INFORMATION SCIENCES, cilt.282, ss.277-295, 2014 (SCI İndekslerine Giren Dergi)
- XXIV. **A simple design method for interval type-2 fuzzy pid controllers**
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- XXV. **Exact inversion of decomposable interval type-2 fuzzy logic systems**
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Karasakal O., Güzelkaya M., EKSİN İ., YESİL E., KUMBASAR T.
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- XXVII. **Type-2 fuzzy model based controller design for neutralization processes**
Kumbasar T., EKSİN İ., Güzelkaya M., YESİL E.
ISA TRANSACTIONS, cilt.51, sa.2, ss.277-287, 2012 (SCI İndekslerine Giren Dergi)
- XXVIII. **Adaptive fuzzy model based inverse controller design using BB-BC optimization algorithm**
Kumbasar T., EKSİN İ., Güzelkaya M., YESİL E.
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- XXIX. **Interval type-2 fuzzy inverse controller design in nonlinear IMC structure**
Kumbasar T., EKSİN İ., Güzelkaya M., YESİL E.
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- XXX. **Big Bang Big Crunch Optimization Method Based Fuzzy Model Inversion**
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- I. **Parameter Optimization of Interval Type-2 Fuzzy Neural Networks Based on PSO and BBBC Methods**
Wang J., Kumbasar T.
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- II. **A fuzzy logic based intelligent autonomous vehicle control system design in the TORCS game environment**
Armagan E., KUMBASAR T.
PAMUKKALE UNIVERSITY JOURNAL OF ENGINEERING SCIENCES-PAMUKKALE UNIVERSITESI MUHENDISLIK BILIMLERI DERGISI, cilt.24, sa.8, ss.1435-1442, 2018 (Diğer Kurumların Hakemli Dergileri)
- III. **Type-2 Fuzzy Logic Control in Computer Games**
Sahin A., Kumbasar T.
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- IV. **Interval type-2 fuzzy PID controllers and an online self-tuning mechanism**
KUMBASAR T.
PAMUKKALE UNIVERSITY JOURNAL OF ENGINEERING SCIENCES-PAMUKKALE UNIVERSITESI MUHENDISLIK BILIMLERI DERGISI, cilt.22, ss.643-649, 2016 (Diğer Kurumların Hakemli Dergileri)
- V. **Interval Type-2 Fuzzy PID Controllers**

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SPRINGER HANDBOOK OF COMPUTATIONAL INTELLIGENCE, ss.285-294, 2015 (Diğer Kurumların Hakemli Dergileri)

- VI. **A Design Methodology and Analysis for Interval Type 2 Fuzzy PI PD Controllers**
MORTAZA A., EKSİN İ., GÜZELKAYA M., KUMBASAR T.
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Kitap & Kitap Bölümleri

- I. **Type-2 Fuzzy Logic Control in Computer Games**
Sahin A., KUMBASAR T.
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- II. **An Overview on Interval Type-2 Fuzzy PID Controllers**
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Handbook of Computational Intelligence, Kacprzyk, Janusz, Pedrycz, Witold , Editör, Springer, 2015

Hakemli Kongre / Sempozyum Bildiri Kitaplarında Yer Alan Yayınlar

- I. **Integrating Interval Type-2 Fuzzy Sets into Deep Embedding Clustering to Cope with Uncertainty**
Bölat K., Kumbasar T.
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- II. **Capturing Uncertainty with Interval Fuzzy Logic Systems through Composite Deep Learning**
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- III. **Enhancing the Learning of Interval Type-2 Fuzzy Classifiers with Knowledge Distillation**
Erdem D., Kumbasar T.
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- IV. **A Design Approach for General Type-2 Fuzzy Logic Controllers with an Online Scheduling Mechanism**
Sakalli A., Kumbasar T., Mendel J.
2020 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), 19 - 24 Temmuz 2020
- V. **Interpreting Variational Autoencoders with Fuzzy Logic: A step towards interpretable deep learning based fuzzy classifiers**
Bölat K., KUMBASAR T.
2020 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Glasgow, United Kingdom, 19 - 24 Temmuz 2020
- VI. **Real-Time Leader-Follower Formation Control of Nano Quadcopters in the Framework of Ratio Control**
Mandacı M., KUMBASAR T.
European Control Conference, 12 - 15 Mayıs 2020
- VII. **Parameter Identification and Auto-Tuning of IPMSM for Self-Commissioning**
Çetin Y., Akyol I. E. , Buyukozturk K. C. , KUMBASAR T.

2020 7th International Conference on Electrical and Electronics Engineering (ICEEE), Antalya, Turkey, 14 - 16 Nisan 2020

- VIII. **Self-Commissioning of Electrical Parameters for Sensorless IPMSM Drives**
çetin y., akyol i. e. , büyüköztürk k. ç. , KUMBASAR T.
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- IX. **Human Operator Modelling with Interval-valued Takagi-Sugeno Fuzzy Models**
tüfekçi a. e. , KUMBASAR T.
International Conference on Electrical and Electronics Engineering, 28 - 30 Kasım 2019
- X. **Big Bang Big Crunch based Near-Optimal Guidance Law for Interceptor Problem**
Banerjee A., Nabi M. u. , KUMBASAR T.
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- XI. **Altitude and Position Control of Parrot Mambo Minidrone with PID and Fuzzy PID Controllers**
Kaplan M. R. , Eraslan A., BEKE A., KUMBASAR T.
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- XII. **A New Insight on the Mappings of Type-2 Fuzzy Logic Systems**
KUMBASAR T.
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- XIII. **Interval Type-2 Fuzzy Systems as Deep Neural Network Activation Functions**
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- XIV. **Real-Time Applications of Fuzzy Logic Control**
KUMBASAR T.
International Symposium on Advanced Electrical and Communication Technologies, 21 - 23 Kasım 2018
- XV. **A Fuzzy Logic based Real Time Two-Wheeled Inverted Pendulum Robot**
Ovur S. E. , Candan F., BEKE A., KUMBASAR T.
th International Conference on Control Engineering Information Technology, 25 - 27 Ekim 2018
- XVI. **Hand Gesture Recognition Systems with the Wearable Myo Armband**
Kaya E., KUMBASAR T.
6th International Conference on Control Engineering Information Technology, 25 - 27 Ekim 2018
- XVII. **Single vs. Double input interval type-2 fuzzy PID controllers: Which one is better?**
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- XVIII. **Analyzing the control surfaces of type-1 and interval type-2 FLCs through an experimental study**
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- XIX. **Design and Deployment of Fuzzy PID Controllers to the nano quadcopter Crazyflie 2.0**
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2018 IEEE International Conference on Innovations in Intelligent Systems and Applications, INISTA 2018, Thessaloniki, Yunanistan, 3 - 05 Temmuz 2018
- XX. **Fuzzy Logic and Computer Games**
KUMBASAR T.
2.International Conference on Theoretical and Applied Computer Science and Engineering, 29 - 30 Haziran 2018
- XXI. **FOLLY: A Self Foldable and Self Deployable Autonomous Quadcopter**
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- XXII. **A Vision Based Positioning Gas Leakage Test Automation System**
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- XXIV. **Fuzzy Logic Based Self-Driving Racing Car Control System**
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- XXV. **Diagnosing Interdental Decays in Mouth Radiography Images using Kernel Fuzzy C means Segmentation and Cascade Object Detector**
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- XXVI. **A Fuzzy Logic Based Autonomous Vehicle Control System Design in the TORCS Environment,**
ARMAGAN E., KUMBASAR T.
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- XXVII. **A Fuzzy Logic Based Autonomous Vehicle Control System Design in the TORCS Environment**
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- XXVIII. **A rule based fuzzy gesture recognition system to interact with Sphero 2.0 using a smart phone**
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- XXIX. **A smart dermoscope design using artificial neural network**
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- XXX. **Landing on the moon with type-2 fuzzy logic**
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- XXXI. **Game of spheros: A real-world pursuit-evasion game with type-2 fuzzy logic**
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- XXXII. **On the design and gain analysis of IT2-FLC with a case study on an electric vehicle**
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- XXXIII. **Birinci Mertebeden Ölü Zamanlı Sistemler için Sistematik bir Bulanık PID Kontrolör Tasarım Yöntemi**
CANKURT R. T. , UZUNOĞLU B., KUMBASAR T.
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- XXXIV. **Gradient Descent and Extended Kalman Filter based Self-Tuning Interval Type-2 Fuzzy PID Controllers**
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- XXXV. **Design and Experimental Validation of Single Input Type-2 Fuzzy PID Controllers as Applied to 3 DOF Helicopter Testbed**
MEHNDIRATTA M., KAYACAN E., Kumbasar T.
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- XXXVI. **Type-2 Fuzzified Flappy Bird Control System**
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XXXVII. An Open Source Matlab/Simulink Toolbox for Interval Type-2 Fuzzy Logic Systems

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XXXVIII. Tip 2 Bulanık PID Kontrolörleri için Yeni Bir Çevrimiçi Öz Ayarlama Yaklaşımı

Dodurka M. F. , Sakalli A., Beke A., Savran A. İ. , Sahin A., KUMBASAR T., Yesil E., Hagraş H.

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XL. A Systematic Type 2 Fuzzy Modelling Methodology for Time Series Forecasting

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XLI. Review Study on Fuzzy Time Series and Their Applications in the Last Fifteen Years

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