

Prof. RAİF TUNA BALKAN

Personal Information

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Education Information

Doctorate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Makine Mühendisliği (Dr), Turkey 1983 - 1988

Post Graduate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Makine Mühendisliği (Y) (Tezi), Turkey 1979 - 1983

Under Graduate, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, Turkey 1975 - 1979

Foreign Languages

English, C1 Advanced

Research Areas

Technical Sciences, Mechanical Engineering, Machine Theory and Dynamics, System Dynamics and Control, Robotics, Mechatronics, Modeling and Simulation of Dynamic Systems

Academic Titles / Tasks

Professor, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2000 - Continues

Professional Experience

Dean, Middle East Technical University, Faculty of Engineering, 2016 - Continues

Head of Department, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2014 - 2017

Deputy Head of Department, Middle East Technical University, Faculty of Engineering, Makine Mühendisliği Bölümü, 2004 - 2008

Advising Theses

BALKAN R. T. , Modeling and performance improvements of a pressure compensated axial piston pump, Post Graduate, O.AYDOĞAN(Student), 2018

BALKAN R. T. , Design of hydraulic valveless control actuation system, Post Graduate, M.CAN(Student), 2016

BALKAN R. T. , Dynamic modeling and control of an electromechanical control actuation system, Post Graduate, Ü.YERLİKAYA(Student), 2016

BALKAN R. T. , Development and control of a single rod electro hydrostatic actuator, Doctorate, H.ÇALIŞKAN(Student), 2015

BALKAN R. T. , PLATİN B. E. , Platform motion disturbances decoupling by means of inertial sensors for a motion stabilized gimbal, Post Graduate, D.MUTLU(Student), 2015

BALKAN R. T. , PLATİN B. E. , Minimum order linear system identification and parameter estimation with application,

Post Graduate, O.CEM(Student), 2014

BALKAN R. T. , PLATİN B. E. , Design, Construction and Control of an Electro-Hydraulic Load Simulator for Testing Hydraulic Drives, Post Graduate, H.ULAŞ(Student), 2014

BALKAN R. T. , Single axis precise motion control using piezoactuator associated with a compliant mechanism, Post Graduate, G.YAŞAR(Student), 2013

BALKAN R. T. , Modeling, simulation and experimental verification of a hydraulic fan drive system, Post Graduate, E.TORAMAN(Student), 2013

BALKAN R. T. , KONUKSEVEN E. İ. , Development of an optical system calibration and alignment methodology using Shack-Hartmann wavefront sensor, Post Graduate, F.ZEHRA(Student), 2013

BALKAN R. T. , Friction identification and compensation in stabilized platforms, Post Graduate, E.SİNCAR(Student), 2013

BALKAN R. T. , Optomechanical analysis and experimental validation of bonding based prism and mirror mounts in a laser system, Post Graduate, U.ÜNAL(Student), 2012

BALKAN R. T. , KONUKSEVEN E. İ. , Identification of kinematic parameters using pose measurements and building a flexible interface, Post Graduate, A.BAYRAM(Student), 2012

BALKAN R. T. , Modelling and experimental evaluation of an electrohydraulic pitch trim servo actuator, Post Graduate, A.ÖZTURAN(Student), 2012

BALKAN R. T. , Modeling and stabilization control of a main battle tank, Doctorate, T.KARAYUMAK(Student), 2011

KÜLAH H., BALKAN R. T. , A MEMS thermoelectric energy harvester for energy generation in mobile systems, Post Graduate, E.TAN(Student), 2011

BALKAN R. T. , Modeling, identification and real time position control of a two-axis Gimbaled mirror system, Post Graduate, K.ÇAĞATAY(Student), 2010

BALKAN R. T. , Development of a SCADA control system for a weighing and bagging machine, Post Graduate, E.SİNEM(Student), 2010

BALKAN R. T. , SÖYLEMEZ E., Dynamic modelling of a backhoe-loader, Post Graduate, B.KILIÇ(Student), 2009

KÜLAH H., BALKAN R. T. , Design, fabrication and implementation of a vibration based MEMS energy scavenger for wireless microsystems, Doctorate, İ.SARI(Student), 2008

BALKAN R. T. , PLATİN B. E. , A real time test setup design and realization for performance verification of controller designs for unmanned air vehicles, Post Graduate, F.KÜREKSİZ(Student), 2008

BALKAN R. T. , Development of sled range test facility for store separation model, Post Graduate, A.ARDA(Student), 2007

BALKAN R. T. , Nonlinear modeling and flight control system design of an unmanned aerial vehicle, Post Graduate, D.KARAKAŞ(Student), 2007

BALKAN R. T. , GPS based altitude control of an unmanned air vehicle using digital terrain elevation data, Post Graduate, S.ATAÇ(Student), 2006

BALKAN R. T. , Design and construction of a six degree of freedom platform, Post Graduate, S.GÜRBÜZ(Student), 2006

BALKAN R. T. , Analysis of welding parameters in gas metal arc welding by a welding robot, Post Graduate, Y.ERENER(Student), 2006

GÖKLER M. İ. , BALKAN R. T. , Acquisition of field data for agricultural tractor, Post Graduate, A.KOYUNCU(Student), 2006

BALKAN R. T. , Design of a secondary packaging robotic system, Post Graduate, H.ŞAHİN(Student), 2005

BALKAN R. T. , PLATİN B. E. , Conceptual design of a model support system and its controller for Ankara wind tunnel, Post Graduate, N.ULUSAL(Student), 2005

BALKAN R. T. , Modeling and real-time control system implementation for a Stewart platform, Post Graduate, O.ALBAYRAK(Student), 2005

BALKAN R. T. , PLATİN B. E. , Design, construction and preliminary testing of an aeroservoelastic test apparatus to be used in Ankara wind tunnel, Post Graduate, S.UTKU(Student), 2005

BALKAN R. T. , Optimal Design of truss structure with actuators, Post Graduate, A.AKÖZ(Student), 2004

BALKAN R. T. , On-line controller tuning by MATLAB® using real system responses, Post Graduate, S.PEKTAŞ(Student), 2004

BALKAN R. T. , PLATİN B. E. , Modeling and control of a stabilization system, Post Graduate, K.AFACAN(Student), 2004

BALKAN R. T. , Design scaling of aerobalistic range models, Post Graduate, Ü.KUTLUAY(Student), 2004

BALKAN R. T. , Design and control of a self-parking model car, Post Graduate, U.AVĞAN(Student), 2003

BALKAN R. T. , Design and manufacturing of a two degree of freedom gyro stabilized opto-mechanical platform, Post Graduate, T.KARAYUMAK(Student), 2003

BALKAN R. T. , Design, construction and performance testing of a ball-beam balancing experimental set-up, Post Graduate, İ.SARI(Student), 2002

BALKAN R. T. , Vibration isolation of a platform with a shock disturbance, Post Graduate, M.PARLAK(Student), 2002

BALKAN R. T. , Computer aided analysis of dynamic systems employing graph theory, Post Graduate, K.ALTUN(Student), 2002

BALKAN R. T. , Design and construction of a 3d laser rangefinder for indoor applications, Post Graduate, U.FİDAN(Student), 2001

BALKAN R. T. , Dynamic modeling and control of a stewart platform type motion simulator, Post Graduate, M.ÖZDAĞLAR(Student), 2001

BALKAN R. T. , Development of a software for the inverse kinematics of six-dof serial link manipulators, Post Graduate, H.TİFTİKÇİ(Student), 2001

BALKAN R. T. , Modeling for robotic spray painting, Post Graduate, U.DALLI(Student), 2000

BALKAN R. T. , Minimum time reorientation of gimbal angles and suppression of gyroscopic noise effects, Post Graduate, M.ERDOĞAN(Student), 2000

BALKAN R. T. , Line of sight stabilization of a thermal imaging system in two axes, Post Graduate, A.ARAT(Student), 2000

BALKAN R. T. , Computer aided design of friction brakes and clutches, Post Graduate, G.KIZILTAŞ(Student), 1998

BALKAN R. T. , Optimal design of power transmission shafts, Post Graduate, A.ATAY(Student), 1998

BALKAN R. T. , Computer aided simulation of enjection molding process for thermoplastic materials, Post Graduate, B.ÖNALIR(Student), 1997

BALKAN R. T. , Determination of a mobile crane characteristics by flexible multibody analysis, Post Graduate, S.KILIÇASLAN(Student), 1997

BALKAN R. T. , Development of a system architecture for off-line programming of robots for arc welding, Post Graduate, M.BULUT(Student), 1997

BALKAN R. T. , Stabilisation of an inverted pendulum by using a fuzzy controller, Post Graduate, M.EMİN(Student), 1995

BALKAN R. T. , Design and construction of a multi-purpose robot gripper, Post Graduate, M.ATILLA(Student), 1994

BALKAN R. T. , Palletizing software developed for multifunctional use of an industrial robot, Post Graduate, A.ŞİŞMAN(Student), 1994

BALKAN R. T. , Optimal control of robotic manipulators using dynamic programming, Post Graduate, N.DEMİRTAŞ(Student), 1992

Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- **A Mathematical Model for Simulation of Flow Rate and Chamber Pressures in Spool Valves**
Afatsun A. C. , BALKAN R. T.
JOURNAL OF DYNAMIC SYSTEMS MEASUREMENT AND CONTROL-TRANSACTIONS OF THE ASME,
vol.141, 2019 (Journal Indexed in SCI)
- **Optical alignment procedure utilizing neural networks combined with Shack-Hartmann wavefront sensor**
Adil F. Z. , Konukseven E. I. , Balkan T., Adila O. F.
OPTICAL ENGINEERING, vol.56, 2017 (Journal Indexed in SCI)
- **A Complete Analysis and a Novel Solution for Instability in Pump Controlled Asymmetric Actuators**
ÇALIŞKAN H., BALKAN R. T. , PLATİN B. E.
JOURNAL OF DYNAMIC SYSTEMS MEASUREMENT AND CONTROL-TRANSACTIONS OF THE ASME,
vol.137, 2015 (Journal Indexed in SCI)
- **Pressure prediction on a variable-speed pump controlled hydraulic system using structured recurrent neural networks**
KILIÇ E., DÖLEN M., ÇALIŞKAN H., KOKU A. B. , Balkan T.
CONTROL ENGINEERING PRACTICE, vol.26, pp.51-71, 2014 (Journal Indexed in SCI)
- **Accurate pressure prediction of a servo-valve controlled hydraulic system**
KILIÇ E., DÖLEN M., KOKU A. B. , ÇALIŞKAN H., Balkan T.
MECHATRONICS, vol.22, pp.997-1014, 2012 (Journal Indexed in SCI)

- **Development of a design verification methodology including strength and fatigue life prediction for agricultural tractors**
Koyuncu A., GÖKLER M. İ. , Balkan T.
INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY, vol.60, pp.777-785, 2012
(Journal Indexed in SCI)
- **An Electromagnetic Micro Power Generator for Low-Frequency Environmental Vibrations Based on the Frequency Upconversion Technique**
Sari I., Balkan T., KÜLAH H.
JOURNAL OF MICROELECTROMECHANICAL SYSTEMS, vol.19, pp.14-27, 2010 (Journal Indexed in SCI)
- **An electromagnetic micro energy harvester based on an array of parylene cantilevers**
Sari I., Balkan T., KÜLAH H.
JOURNAL OF MICROMECHANICS AND MICROENGINEERING, vol.19, 2009 (Journal Indexed in SCI)
- **An electromagnetic micro power generator for wideband environmental vibrations**
Sari I., Balkan T., KÜLAH H.
SENSORS AND ACTUATORS A-PHYSICAL, vol.145, pp.405-413, 2008 (Journal Indexed in SCI)
- **Modeling of paint flow rate flux for elliptical paint sprays by using experimental paint thickness distributions**
Arikan M., Balkan T.
INDUSTRIAL ROBOT-AN INTERNATIONAL JOURNAL, vol.33, pp.60-66, 2006 (Journal Indexed in SCI)
- **A kinematic structure-based classification and compact kinematic equations for six-dof industrial robotic manipulators**
Balkan T., Ozgoren M., Arikan M., Baykurt H.
MECHANISM AND MACHINE THEORY, vol.36, pp.817-832, 2001 (Journal Indexed in SCI)
- **Process simulation and paint thickness measurement for robotic spray painting**
Arikan M., Balkan T.
CIRP ANNALS-MANUFACTURING TECHNOLOGY, vol.50, pp.291-294, 2001 (Journal Indexed in SCI)
- **A method of inverse kinematics solution including singular and multiple configurations for a class of robotic manipulators**
Balkan T., Ozgoren M., Arikan M., Baykurt H.
MECHANISM AND MACHINE THEORY, vol.35, pp.1221-1237, 2000 (Journal Indexed in SCI)
- **Process modeling, simulation, and paint thickness measurement for robotic spray painting**
Arikan M., Balkan T.
JOURNAL OF ROBOTIC SYSTEMS, vol.17, pp.479-494, 2000 (Journal Indexed in SCI)
- **Modeling of paint flow rate flux for circular paint sprays by using experimental paint thickness distribution**
Balkan T., Arikan M.
MECHANICS RESEARCH COMMUNICATIONS, vol.26, pp.609-617, 1999 (Journal Indexed in SCI)
- **Tipping loads of mobile cranes with flexible booms**
Kilicaslan S., Balkan T., Ider S.
JOURNAL OF SOUND AND VIBRATION, vol.223, pp.645-657, 1999 (Journal Indexed in SCI)
- **A dynamic programming approach to optimal control of robotic manipulators**
Balkan T.
MECHANICS RESEARCH COMMUNICATIONS, vol.25, pp.225-230, 1998 (Journal Indexed in SCI)
- **Application of computer-aided injection moulding simulation for thermoplastic materials**
Onalir B., Kaftanoglu B., Balkan T.
INTERNATIONAL JOURNAL OF MATERIALS & PRODUCT TECHNOLOGY, vol.13, pp.282-300, 1998 (Journal Indexed in SCI)
- **A load control system for mobile cranes**
Balkan T.
MECHANICS RESEARCH COMMUNICATIONS, vol.23, pp.395-400, 1996 (Journal Indexed in SCI)

- **Yapay Sinir Ağ Modellerinin Valf Denetimli Hidrolik Bir Sistemin Uzun Süreli Basınç Tahmininde Kullanılması**

KILIÇ E., ÇALIŞKAN H., DÖLEN M., KOKU A. B. , BALKAN R. T.
Mühendis ve Makina, vol.53, pp.50-61, 2012 (Other Refereed National Journals)

- **ATV Tabanlı İnsansız Kara Aracı Geliştirilmesi**

BAYAR G., KONUKSEVEN E. İ. , KOKU A. B. , BALKAN R. T.
Makina Tasarım ve İmalat Dergisi, vol.9, pp.55-66, 2007 (Other Refereed National Journals)

Refereed Congress / Symposium Publications in Proceedings

- **Increasing the Bandwidth Frequency by Coulomb Friction Compensation Method in Electromechanical Control Actuation Systems**

YERLİKAYA Ü., BALKAN R. T.
IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Hong Kong, 8 - 12 July 2019

- **Identification of Viscous and Coulomb Friction in Motion Constrained Systems**

Yerlikaya U., BALKAN R. T.
IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Auckland, New Zealand, 9 - 12 July 2018, pp.91-96

- **Identification of Viscous and Coulomb Friction in Motion Constrained Systems**

YERLİKAYA Ü., BALKAN R. T.
The 2018 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Auckland, New Zealand, 9 - 12 July 2018

- **Tarım Traktörlerinde Kullanılan Ön Yükleyicinin Hidrolik Sisteminin Modellenmesi ve Simülasyonu**

GÜLTEKİN İ. İ. , CÖMERT S. A. , ŞAHİN A., ERKAL G., KARAKOÇ E. M. , Ünlüsoy Y. S. , BALKAN R. T.
VIII. Ulusal Hidrolik Pnömatik Kongresi, İzmir, Turkey, 22 - 25 November 2017

- **DYNAMIC MODELING AND CONTROL OF AN ELECTROMECHANICAL CONTROL ACTUATION SYSTEM**

Yerlikaya U., BALKAN R. T.
10th ASME Annual Dynamic Systems and Control Conference, Virginia, United States Of America, 11 - 13 October 2017

- **Proceedings of the ASME 2017 Dynamic Systems and Control Conference**

Yerlikaya Ü., BALKAN R. T.
ASME 2017 Dynamic Systems and Control Conference, 11 - 13 October 2017

- **An online intelligent algorithm pipeline for the elimination of springback effect during sheet metal bending**

Dilan R. A. , BALKAN R. T. , Platin B. E.
International Conference on the Technology of Plasticity, ICTP 2017, Cambridge, Canada, 17 - 22 September 2017, vol.207, pp.1576-1581

- **Hareket Kısıtlı Sistemlerde Viskoz ve Coulomb Sürtünme Tanılaması**

Yerlikaya Ü., BALKAN R. T.
18. Ulusal Makina Teorisi Sempozyumu, Trabzon, Turkey, 5 - 07 July 2017

- **Elektromekanik Kontrol Tahrik Sisteminin Matematiksel Modellenmesi ve Kontrolü**

Yerlikaya Ü., BALKAN R. T.
Türkiye Robotbilim Konferansı (TORK), İstanbul, Turkey, 2 - 03 November 2016

- **Modelling and Simulation of Power Steering System for Agricultural Tractors**

Gültekin İ. İ. , Cömert S. A. , Erkal G., Ünlüsoy Y. S. , BALKAN R. T.
International Conference on Advances in Automotive Technologies 2016 – AAT2016, 11 - 14 October 2016

- **Application of Multivariate Adaptive Regression Splines to Sheet Metal Bending Process for Springback Compensation**

Dilan R. A. , Balkan T., PLATİN B. E.
12th International Conference on Numerical Methods in Industrial Forming Processes (NUMIFORM), Troyes, France, 4 - 07 July 2016, vol.80

- **A Complete Analysis for Pump Controlled Single Rod Actuator**

ÇALIŞKAN H., BALKAN R. T. , Platin B. E.

10th International Fluid Power Conference (10. IFK), 8 - 10 March 2016, vol.2, pp.119-132

- **Compensation of Friction Effects in Gyro-Stabilized Motion Platforms**

Sincar E., BALKAN R. T. , PLATİN B. E.

American Control Conference, Illinois, United States Of America, 1 - 03 July 2015, pp.3242-3248

- **A CONTROL SYSTEM FOR HYDRAULIC SINGLE AXIS DURABILITY TEST RIG**

ÇALIŞKAN H., BALKAN R. T. , PLATİN B. E. , KONUKSEVEN E. İ.

5th Annual Dynamic Systems and Control Division Conference / 11th JSME Motion and Vibration Conference, Florida, United States Of America, 17 - 19 October 2012, pp.723-732

- **3 Serbestlik Derecesine Sahip Bir Hareket Taklitçisinin Mafsalsal Uzağı Eniyilemesi ve Çözüm Analizi**

DİLAN R. A. , YAMAN U., ÇALIŞKAN H., DEMİNER S., BALKAN R. T.

VI. Ulusal Hidrolik Pnömatik Kongresi, İzmir, Turkey, 12 - 15 October 2011, pp.539-552

- **HYDRAULIC POSITION CONTROL SYSTEM WITH VARIABLE SPEED PUMP**

ÇALIŞKAN H., BALKAN R. T. , PLATİN B. E.

2nd Annual Dynamic Systems and Control Conference (DSCC 2009)/Bath/ASME Symposium on Fluid Power and Motion Control, California, United States Of America, 12 - 14 October 2009, pp.275-282

- **An Electromagnetic Micro Power Generator for Low Frequency Environmental Vibrations Based on the Frequency Up Conversion Technique**

Sari İ., BALKAN R. T. , KÜLAH H.

22nd IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2009), Sorrento, Italy, 25 - 29 January 2009, pp.1075-1078

- **A micro power generator with planar coils on parylene cantilevers**

Sari İ., BALKAN R. T. , KÜLAH H.

Conference on PhD Research in Microelectronics and Electronics, İstanbul, Turkey, 22 - 25 June 2008, pp.133-136

- **Optimal posture control for a 7 DOF haptic device based on power minimization**

Baser O., KONUKSEVEN E. İ. , BALKAN R. T.

6th EuroHaptics International Conference, Madrid, Spain, 10 - 13 June 2008, vol.5024, pp.555-560

Expert Reports

- **Yürüyen merdiven sisteminin onarım firması tarafından yenisi ile değiştirilip deg'is, tirilmedig'inin tespiti**

YAMAN U., BALKAN R. T. , KONUKSEVEN E. İ.

ANADOLU ANONİM TÜRK SİGORTA ŞİRKETİ, pp.5, Ankara, 2017

- **"NWL Diamond Reaming Shell (Step Profile) – Elmaslı Portkron" isimli parçanın incelenmesi**

YAMAN U., KONUKSEVEN E. İ. , YAMAN U.

Barkom Grup Sondaj Mak. Ve Ekip. San. Tic. Ltd. Şti., pp.4, Ankara, 2016

Supported Projects

BALKAN R. T. , Project Supported by Higher Education Institutions, Abkant Presler için Otomatikleştirilmiş Malzeme Büküm Yardımı, 2015 - 2016

Patent

BALKAN R. T. , Otomatik kapı açma mekanizması içeren bir bulaşık makinası, Patent, CHAPTER F Mechanical engineering; Lighting; Heating; Weaponry; Destroyed Materials, Initial Registration, 2015

Citations

Total Citations (WOS):606

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