

# Prof. Aydın YEŞİLDİREK

## Personal Information

**Fax Phone:** [+90 212 383 2888](tel:+902123832888)

**Email:** [aydiny@yildiz.edu.tr](mailto:aydiny@yildiz.edu.tr)

**Web:** <https://avesis.yildiz.edu.tr/aydiny>

## International Researcher IDs

ScholarID: 6Y84x94AAAAJ

ORCID: 0000-0002-8404-9877

Publons / Web Of Science ResearcherID: B-1216-2016

ScopusID: 56315892100

Yoksis Researcher ID: 205464

## Education Information

Doctorate, Texas Üniversitesi, Elektrik Mühendisliği, Elektrik Mühendisliği, Turkey 1992 - Continues

Case Western Reserve Üniversitesi, Elektrik Mühendisliği Ve Uygulamalı Fizik, Elektrik Mühendisliği Ve Uygulamalı Fizik, Turkey 1989 - Continues

Undergraduate, Istanbul Technical University, Elektrik Ve Elektronik, Elektronik Ve Haberleşme, Turkey 1982 - Continues

## Foreign Languages

English, C1 Advanced

Spanish, B2 Upper Intermediate

## Dissertations

Doctorate, Nonlinear Systems Control Using Neural Networks, The University Of Texas At Arlington, Electrical Engineering, Electrical Engineering, 1994

Postgraduate, Multirate System Identification and Adaptive Control, Case Western Reserve University, Electrical Engineering And Applied Physics, Electrical Engineering And Applied Physics, 1992

## Research Areas

Information Systems, Communication and Control Engineering, Control and System Engineering, Simulation, Modelling and Identification, Nonlinear Systems, Status Observers and Estimation, Robotics and Mechatronics Systems, Smart Factors, Mechatronic Systems, Route and Motion Planning, Mechanical Engineering, Machine Theory and Dynamics, Robotics, Engineering and Technology

## Academic Titles / Tasks

Associate Professor, Yildiz Technical University, Department Of Mechatronics Engineering, Mechatronics, 2014 - Continues

## Advising Theses

- Yeşildirek A., Visual assisted formation control of distributed UAV swarm, Postgraduate, O.ÖZTÜRK(Student), 2021
- Yeşildirek A., Sensör füzyonu algoritmaları ile açısız konum referans sistemi tasarımı, Postgraduate, O.ÖZKAN(Student), 2019
- Yeşildirek A., Control of autonomous mobile robots using reinforcement learning, Postgraduate, C.DOĞUKAN(Student), 2019
- Yeşildirek A., İnsansız hava araçlarında görüntü işleme tabanlı iniş sistemi tasarımı ve gerçekleştirilmesi, Postgraduate, A.VURGUN(Student), 2019
- Yeşildirek A., Derin öğrenme teknikleriyle robotlarda hedef takibi, Postgraduate, Ö.ALTINIŞIK(Student), 2018
- YEŞİLDİREK A., Modelling and Control of Autonomous Underwater Vehicles (AUVs), Postgraduate, A.Yalman(Student), 2017
- Yeşildirek A., İki ayaklı robotların modellenmesi ve kontrolü, Postgraduate, K.MÜDERRİSOĞLU(Student), 2016
- Yeşildirek A., Nonlinear Adaptive Control of Quadrotor, Postgraduate, B.Emran(Student), 2014
- Sertbaş A., Yeşildirek A., Otonom hava aracının kokpit görüntüsünün modellenmesi ve aracın hareketine göre bilgisayarda simülasyonunun yapılması, Postgraduate, Y.TAŞ(Student), 2013

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

- I. **An intelligent aortic valve model for complete cardiac cycle**  
İŞCAN M., YEŞİLDİREK A.  
International Journal for Numerical Methods in Biomedical Engineering, 2024 (SCI-Expanded)
- II. **Novel aortic heart valve model parameterizing normal and pathological cases: Aortic stenosis and regurgitation**  
İşcan M., Yeşildirek A.  
Transactions of the Institute of Measurement and Control, vol.45, no.15, pp.2997-3010, 2023 (SCI-Expanded)
- III. **A New Cardiovascular Mock Loop Driven by Novel Active Capacitance in Normal and Abnormal Conditions**  
İşcan M., Yesildirek A.  
APPLIED BIONICS AND BIOMECHANICS, pp.1-20, 2023 (SCI-Expanded)
- IV. **Closed-Form DoA Solution for Co-Centered Orthogonal Microphone Arrays Based on Multilateration Equations**  
Zengin K., Yeşildirek A.  
APPLIED SCIENCES, vol.13, no.20, pp.1, 2023 (SCI-Expanded)
- V. **An Autonomous Marine Mucilage Monitoring System**  
Sanver U., Yeşildirek A.  
Sustainability (Switzerland), vol.15, no.4, 2023 (SCI-Expanded)
- VI. **Modelling Transient Cardiovascular Hemodynamics with Physiological Conscious Autoencoder**  
Iscan M., Yeşildirek A.  
IEEE ACCESS, vol.10, no.1, pp.1-8, 2023 (SCI-Expanded)
- VII. **Adaptive feedback linearization using efficient neural networks**  
Yesildirek A., LEWIS F.  
JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.31, pp.253-281, 2001 (SCI-Expanded)
- VIII. **Robust force/motion control of constrained robots using neural network**  
Kwan C., Yesildirek A., Lewis F.  
JOURNAL OF ROBOTIC SYSTEMS, vol.16, no.12, pp.697-714, 1999 (SCI-Expanded)
- IX. **A neural network controller for flexible-link robots**  
Yesildirek A., Vandegrift M., Lewis F.  
JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.17, no.4, pp.327-349, 1996 (SCI-Expanded)
- X. **Multilayer neural-net robot controller with guaranteed tracking performance**

- LEWIS F., Yesildirek A., LIU K.  
IEEE TRANSACTIONS ON NEURAL NETWORKS, vol.7, no.2, pp.388-399, 1996 (SCI-Expanded)
- XI. **NEURAL-NET ROBOT CONTROLLER WITH GUARANTEED TRACKING PERFORMANCE**  
LEWIS F., LIU K., YESILDIREK A.  
IEEE TRANSACTIONS ON NEURAL NETWORKS, vol.6, no.3, pp.703-715, 1995 (SCI-Expanded)
- XII. **Feedback linearization using neural networks**  
Yeşildirek A., Lewis F.  
Automatica, vol.31, no.11, pp.1659-1664, 1995 (SCI-Expanded)
- XIII. **NEURAL-NET ROBOT CONTROLLER - STRUCTURE AND STABILITY PROOFS**  
LEWIS F., YESILDIREK A., LIU K.  
JOURNAL OF INTELLIGENT & ROBOTIC SYSTEMS, vol.12, no.3, pp.277-299, 1995 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Geri Dönüşümlü Yapay Sinir Ağı Tabanlı T Dalgası Sonu Tespiti**  
Yeşildirek A.  
Ömer Halisdemir Üniversitesi Mühendislik Bilimleri Dergisi, vol.9, no.1, pp.622-636, 2020 (Peer-Reviewed Journal)
- II. **Attitude and Heading Reference System Design with Sensor Fusion Algorithms**  
YEŞİLDİREK A., Oben Ö.  
Bayburt Üniversitesi Fen Bilimleri Dergisi, vol.2, no.1, 2019 (Peer-Reviewed Journal)
- III. **Controlling a VTOL in 2-DOF Subspaces**  
Emran B., YEŞİLDİREK A.  
International Journal of Materials, Mechanics and Manufacturing, vol.2, no.3, pp.187-192, 2014 (Peer-Reviewed Journal)
- IV. **Robust nonlinear composite adaptive control of quadrotor**  
Emran B., YEŞİLDİREK A.  
International Journal of Digital Information and Wireless Communications (IJDIWC), vol.4, no.2, pp.45-57, 2014 (Peer-Reviewed Journal)
- V. **Design and Development of a Networked Control System Platform for Unmanned Aerial Vehicles**  
Tas Y., YEŞİLDİREK A., Sertbas A.  
Journal of Emerging Trends in Computing and Information Sciences, vol.4, no.12, pp.9-16, 2013 (Peer-Reviewed Journal)
- VI. **Controlling a VTOL in 2-DOF Subspaces** DOI: 10.7763/IJMMM.2014.V2.125  
YEŞİLDİREK A., Emran B.  
International Journal of Materials, Mechanics and Manufacturing, vol.4, pp.187-192, 1 (Peer-Reviewed Journal)

## Books & Book Chapters

- I. **Neural Network Control of Robot Manipulators and Nonlinear Systems**  
Yeşildirek A.  
in: Neural Systems for Control, Omidvar O., Elliott D.L., Editor, Academic Press, Massachusetts, pp.161-212, 1999
- II. **Neural network control of robot manipulators and non linear systems**  
Lewis F., Sarangapani J., Yeşildirek A.  
CRC, New York, Massachusetts, 1998

## Refereed Congress / Symposium Publications in Proceedings

- I. **SHIP ROLL MOTION DAMPING USING ACTIVE FIN STABILIZERS WITH SLIDING MODE CONTROL**

KARABÜBER A. K., YEŞİLDİREK A., ÇAKICI F.

2nd INTERNATIONAL ISTANBUL CONGRESS OF MULTIDISCIPLINARY SCIENTIFIC RESEARCH, İstanbul, Turkey, 28 - 29 September 2022

- II. **WORST CASE DELAY ANALYSIS OF ARINC 664: COMPARING THEORY WITH OMNET++ SIMULATION**  
Savas P., Akpolat E. C., Demir M., Hökelek İ., YEŞİLDİREK A.  
The 19th International Conference on Modeling, Simulation & Visualization Methods, Las Vegas, United States Of America, 14 June 2022
- III. **Monitoring of Irregularity on Sea Surface from Land-Taken Images**  
Sanver U., YEŞİLDİREK A.  
2022 Conference of Russian Young Researchers in Electrical and Electronic Engineering, ElConRus 2022, St. Petersburg, Russia, 25 - 28 January 2022, pp.1417-1422
- IV. **A Curvature Based Path Planning Optimized for Highways**  
Bal T., YEŞİLDİREK A.  
MEKON 2021, İstanbul, Turkey, 25 June 2021
- V. **Intelligent Driver Behavior Modeling and Monitoring for Semi-Autonomous Vehicles**  
Tavukçu M., Keşen M., Soytürk N., Aşkar B., Yeşildirek A.  
MEKON 2021, İstanbul, Turkey, 25 June 2021, pp.1-6
- VI. **İnsansız hava aracı sürülerinin görsel yardımcı formasyon kontrolü**  
öztürk o., YEŞİLDİREK A.  
2nd International Eurasian Conference on Science, Engineering and Technology, Gaziantep, Turkey, 7 - 09 October 2020
- VII. **Fizyolojik Avantajlı Dirsek Altı Bir Protez Kol Tasarımı ve Gerçeklenmesi**  
Şahin H., Sarıözkan Ş., Emeç C., YEŞİLDİREK A.  
Türkiye Robotbilim Konferansı (ToRK) 2019, İstanbul, Turkey, 26 June 2019, vol.1
- VIII. **Control of Autonomous Mobile Robots using Reinforcement Learning**  
Engin D., Yeşildirek A.  
Ereğli International Science and Academic Congress, Zonguldak, Turkey, 9 - 10 March 2019
- IX. **İNSANSIZ HAVA ARAÇLARINDA GÖRÜNTÜ İŞLEME TABANLI İNİŞ SİSTEMİ TASARIMI VE GERÇEKLEMESİ**  
Vurgun A., Yeşildirek A.  
UBAK2019, Yalova, Turkey, 14 - 17 February 2019, pp.251-261
- X. **Towards the Internet of Robotic Things: Analysis, Architecture, Components and Challenges**  
Afanasyev I., Mazzara M., Chakraborty S., Zhuchkov N., Maksatbek A., YEŞİLDİREK A., Kassab M., Distefano S.  
12th International Conference on the Developments in eSystems Engineering (DeSE), Kazan, Russia, 7 - 10 October 2019, pp.3-8
- XI. **Hand gesture movement classification based on dynamically structured neural network**  
İŞCAN M., emeç c., YEŞİLDİREK A.  
2018 Electric Electronics, Computer Science, Biomedical Engineerings'xx Meeting (EBBT), İstanbul, Turkey, 18 - 19 April 2018
- XII. **R-R-R Robot Control with Adaptive Layer Number Neural-Network PD Controller**  
Altınışık Ö., Yeşildirek A.  
IMSMATEC'xx18, İzmir, Turkey, 10 - 12 April 2018
- XIII. **Decoupled Nonlinear Control Design and Simulation of Torpedo Shaped Autonomous Underwater Vehicles (AUVs)**  
Yalman A., YEŞİLDİREK A.  
2nd International Conference on Engineering Technology and Applied Sciences, Baia-Mare, Romania, 20 - 21 April 2017
- XIV. **İki Ayaklı Bir Alt Uzvuun Yürüyüş Düzeninin Olusturulması ve Kontrolü**  
Müderrişoğlu k., YEŞİLDİREK A.  
Türkiye Robot Bilim Konferansı, İstanbul, Turkey, 2 - 03 November 2016
- XV. **Defining and Controlling Gait Cycle for Biped Walking in Sagittal Plane**

Müdürrisođlu K., YEŐİLDİREK A.

International Conference On Engineering And Natural Science, Sarejevo, Bosnia And Herzegovina, 24 - 28 May 2016

- XVI. Defining and Controlling Gait Cycle for Biped Walking in Sagittal Plane**  
Muderrisoglu K., Yeşildirek A.  
ICENS, International Conference On Engineering And Natural Science, Sarajevo, Bosnia And Herzegovina, 24 - 28 May 2016
- XVII. Designing and modeling of a point absorber wave energy converter with hydraulic power take-off unit**  
ENGIN C. D., YEŐİLDİREK A.  
4th International Conference on Electric Power and Energy Conversion Systems, EPECS 2015, Sharjah, United Arab Emirates, 24 - 26 November 2015
- XVIII. Control of A Cantilever Pipe Conveying Fluid using Neural Network**  
Demir M. H., YEŐİLDİREK A., Yigit F.  
6th International Conference on Modeling, Simulation, and Applied Optimization (ICMSAO), İstanbul, Turkey, 27 - 29 May 2015
- XIX. Nonlinear Control of Quadrotor Using Multi Lyapunov Functions**  
Yesildirek A., IMRAN B.  
American Control Conference, Oregon, United States Of America, 4 - 06 December 2014, pp.3844-3849
- XX. Nonlinear Composite Adaptive Control for Quadrotor Copter**  
IMRAN B., YEŐİLDİREK A.  
2013 EEECEGC, Dubai, United Arab Emirates, 11 December 2013, pp.1-6
- XXI. Remote monitoring of power system apparatus in the context of smart grid**  
QASIM M., HODA S., AL ZAABI M., MAHDI N., GOPAKUMAR G., ABU RAHMA S., EL-HAG A., Yesildirek A.  
2012 8th International Symposium on Mechatronics and its Applications, ISMA 2012, Sharjah, United Arab Emirates, 10 - 12 April 2012
- XXII. Development of a Networked Control System Platform for Unmanned Aerial Vehicles**  
Tas Y., Yesildirek A., Sertbas A.  
International Conference on Computer Systems and Industrial Informatics (ICCSII), Sharjah, United Arab Emirates, 18 - 20 December 2012
- XXIII. A Cost Effective Trigger Circuit for an On-line Multi-sensor Partial Discharge Monitoring System**  
AL ZAABI M., SALAH M., QASIM M., EL-HAG A., Yesildirek A.  
IEEE International Symposium on Electrical Insulation (ISEI), San Juan, Argentina, 10 - 13 June 2012, pp.104-107
- XXIV. Anti-swing control of underactuated overhead crane system using multiple Lyapunov functions**  
Yesildirek A.  
2011 IEEE International Conference on Mechatronics and Automation, ICMA 2011, Beijing, China, 7 - 10 August 2011, pp.428-432
- XXV. System identification of UAV under an autopilot trajectory using ARX and hammerstein-wiener methods**  
KHALIL B., Yesildirek A.  
7th International Symposium on Mechatronics and its Applications, ISMA'10, Sharjah, United Arab Emirates, 20 - 22 April 2010
- XXVI. Intelligent Control of Overhead Gantry Cranes**  
Yesildirek A.  
6th International Symposium on Mechatronics and its Applications, Sharjah, United Arab Emirates, 23 - 26 March 2009, pp.29-34
- XXVII. Fractal dimension and similarity search in high-dimensional spatial databases**  
MALCOK M., ASLANDOGAN Y. A., Yesildirek A.  
IEEE International Conference on Information Reuse and Intergration (IRI 2006), Hawaii, United States Of America, 16 - 18 September 2006, pp.380-381
- XXVIII. Robust force/motion control of flexible-joint robots using neural networks**

- KWAN C., YESILDIREK A., LEWIS F.  
1995 American Control Conference, Washington, United States Of America, 21 - 23 June 1995, pp.4460-4465
- XXIX. **Neural net controller for robots with hebbian tuning and guaranteed tracking**  
Yesildirek A., Lewis F.  
Proceedings of the 1995 American Control Conference. Part 1 (of 6), Seattle, WA, USA, 21 - 23 June 1995, vol.4, pp.2784-2789
- XXX. **A neural net controller for robots with Hebbian tuning and guaranteed tracking**  
YESILDIREK A., LEWIS F.  
1995 American Control Conference, Washington, United States Of America, 21 - 23 June 1995, pp.2784-2789
- XXXI. **Neural network controller for feedback linearization**  
Yesildirek A., Lewis F.  
Proceedings of the 2nd IEEE International Symposium on Requirements Engineering, York, Sierra Leone, 27 - 29 March 1995, vol.3, pp.2494-2499
- XXXII. **Neural network controller for flexible-link robots**  
Yesildirek A., Vandegrift M., Lewis F.  
Proceedings of the 1994 IEEE International Symposium on Intelligent Control, Columbus, OH, USA, 16 - 18 August 1994, pp.63-68
- XXXIII. **A NEURAL NETWORK CONTROLLER FOR FEEDBACK LINEARIZATION**  
YESILDIREK A., LEWIS F.  
33rd IEEE Conference on Decision and Control, Florida, United States Of America, 14 - 16 December 1994, pp.2494-2499
- XXXIV. **ROBUST FORCE MOTION CONTROL OF CONSTRAINED ROBOTS USING NEURAL NETWORK**  
KWAN C., YESILDIREK A., LEWIS F.  
33rd IEEE Conference on Decision and Control, Florida, United States Of America, 14 - 16 December 1994, pp.1862-1867
- XXXV. **FEEDBACK LINEARIZATION USING NEURAL NETWORKS**  
YESILDIREK A., LEWIS F.  
1994 IEEE International Conference on Neural Networks (ICNN 94) - 1st IEEE World Congress on Computational Intelligence, Florida, United States Of America, 26 - 29 June 1994, pp.2539-2544
- XXXVI. **A NEURAL-NETWORK CONTROLLER FOR FLEXIBLE-LINK ROBOTS**  
YESILDIREK A., VANDEGRIFT M., LEWIS F.  
1994 IEEE International Symposium on Intelligent Control, Ohio, United States Of America, 16 - 18 August 1994, pp.63-68
- XXXVII. **NEURAL-NET ROBOT CONTROLLER - STRUCTURE AND STABILITY PROOFS**  
LEWIS F., YESILDIREK A., LIU K.  
32nd IEEE Conference on Decision and Control, San-Antonio, Northern Mariana Islands, 15 - 17 December 1993, pp.2785-2791
- XXXVIII. **Neural net robot controller with guaranteed stability**  
Lewis F., Yesildirek A., Liu K.  
3rd International Conference on Industrial Fuzzy Control and Intelligent Systems, IFIS 1993, Texas, United States Of America, 1 - 03 December 1993, pp.103-108
- XXXIX. **NEURAL-NET ROBOT CONTROLLER WITH GUARANTEED TRACKING PERFORMANCE**  
LEWIS P., LIU K., YESILDIREK A.  
1993 IEEE International Symposium on Intelligent Control, Illinois, United States Of America, 25 - 27 August 1993, pp.225-231

## Expert Reports

- I. **Yeniköy ve Kemerköy Termal Enerji Santrallerinin Rehabilitasyonu Projesi Bilirkişi Raporu**  
Yeşildirek A.

## Supported Projects

YEŞİLDİREK A., TUBITAK Project, "Yapay Zeka Algoritması ile EMG kontrollü protez kol tasarımı", 2019 - Continues

YEŞİLDİREK A., TUBITAK Project, "Otomatik Yönlendirmeli Araç", 2018 - Continues

YEŞİLDİREK A., TUBITAK Project, "ADAS için kamera tabanlı nesne tanımlama ve çevre haritalama", 2018 - Continues

Yeşildirek A., TUBITAK Project, "Sınır güvenliği izleme sistemi", 2021 - 2022

Yeşildirek A., Project Supported by Other Official Institutions, "Yapay Zeka Kullanımı ile Depo Envanter Kontrolü için Otonom Hava Aracı Tasarımı", 2019 - 2019

YEŞİLDİREK A., TUBITAK Project, "ARAÇLARDA GÖRÜNTÜ TABANLI ŞERİT TAKİP SİSTEMİNİN YAPAY ZEKAYLA GELİŞTİRİLMESİ", 2018 - 2019

YEŞİLDİREK A., TUBITAK Project, "GPS/INS Entegrasyonu", 2018 - 2018

Arslan A., Yeşildirek A., TUBITAK Project, "Sivil ve Taktik/Navigasyon Askeri Uygulamalar için MEMS Tabanlı GPS Destekli Ataletsel Navigasyon Sisteminin Geliştirilmesi", 2017 - 2018

YEŞİLDİREK A., YILMAZ C., Project Supported by Higher Education Institutions, "İnsansız Hava Araçları için Otopilot Tasarımı Platformu Geliştirilmesi", 2016 - 2018

YEŞİLDİREK A., TUBITAK Project, "Uzaktan kontrollü 5 eksenli router tasarımı", 2016 - 2017

YEŞİLDİREK A., TUBITAK Project, "El hareketlerini sensör eldivenle algılayan sistem tasarımı", 2014 - 2015

YEŞİLDİREK A., TUBITAK Project, "Enerji şamandırası tasarımı ve gerçekleştirilmesi", 2014 - 2015

## Activities in Scientific Journals

Ömer Halisdemir Üniversitesi Online Dergi Sistemi, Editor, 2016 - Continues

## Scientific Refereeing

TURKISH JOURNAL OF ELECTRICAL ENGINEERING & COMPUTER SCIENCES, National Scientific Refreed Journal, May 2018

Pamukkale Üniversitesi Mühendislik Bilimleri Dergisi Yayın Kurulu, National Scientific Refreed Journal, February 2018

TUBITAK Project, October 2017

TUBITAK Project, June 2017

## Metrics

Publication: 61

Citation (WoS): 1493

Citation (Scopus): 2104

H-Index (WoS): 11

H-Index (Scopus): 12

## Awards

Yeşildirek A., Emeç C., Sariözkan Ş., Şahin H., Tübitak 2242 Üniversite öğrenci projeleri İstanbul Bölgesi yarışması 2019, Tübitak, June 2019

Yeşildirek A., Obaid N., Ali ., Mahmoud R. O., Nabtiti M., 2014 ImagineCup UAE , Microsoft, May 2014

Yeşildirek A., Vandigrift M., Lewis F., 1997 best paper award, Automation And Robotics Research Institute, Ft. Worth, Tx,

May 1997

Yeşildirek A., Lewis F., 1996 best patent award, 11) Automation And Robotics Research Institute, Ft. Worth, May 1995