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International Researcher IDs

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Education Information

Doctorate, New York University, Engineering, Electrical and Computer Engineering, United States Of America 2006 - 2010

Postgraduate, Bursa Uludağ University, FEN BİLİMLERİ ENSTİTÜSÜ, Electronic Engineering, Turkey 2000 - 2002

Undergraduate, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, Electronic Engineering, Turkey 1994 - 1999

Foreign Languages

English, C1 Advanced

Dissertations

Doctorate, NEW TECHNIQUES IN MULTIMEDIA FORENSICS, Polytechnic Institute Of New York University, Elektrik Mühendisliği, 2010

Research Areas

Signal Processing, Multimedia, Image and Video Processing, Pattern Recognition and Analysis, Signal Processing Theory and Methods, Artificial Intelligence, Computer Learning and Pattern Recognition

Academic Titles / Tasks

Professor, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, BİLGİSAYAR MÜHENDİSLİĞİ, 2021 - Continues

Associate Professor, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, BİLGİSAYAR MÜHENDİSLİĞİ, 2016 - 2021

Associate Professor, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, ELEKTRİK-ELEKTRONİK MÜHENDİSLİĞİ, 2015 - 2016

Assistant Professor, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, ELEKTRİK-ELEKTRONİK MÜHENDİSLİĞİ, 2012 - 2015

Research Assistant, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, ELEKTRİK-ELEKTRONİK MÜHENDİSLİĞİ, 2000 -

2012

Research Assistant, Polytechnic Institute of New York, Polytechnic Institute, Electrical and Engineering, 2006 - 2010

Research Assistant, Polytechnic University, Engineering, Electrical and Computer Engineering, 2004 - 2005

Academic and Administrative Experience

Head of Department, Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, Bilgisayar Mühendisliği Bölümü, 2016 - 2023

Bursa Uludağ University, MÜHENDİSLİK FAKÜLTESİ, Elektrik-Elektronik Mühendisliği Bölümü, 2013 - 2014

Advising Theses

DİRİK A. E., Deep learning based secure face recognition with 3D depth camera, Postgraduate, S.Yıldız(Student), 2021

DİRİK A. E., Deep learning based speech recognition system design, Postgraduate, B.Korcuklu(Student), 2021

Dirik A. E., Advanced Methods in Source Authentication and Identification in Computer Forensics, Doctorate, A.KARAKÜÇÜK(Student), 2021

Dirik A. E., Modern techniques in forensic analysis of multimedia signals, Doctorate, S.VATANSEVER(Student), 2019

Dirik A. E., Deep learning based self-driving vehicle systems, Postgraduate, K.AKİ(Student), 2019

Dirik A. E., Deep learning based object detection, Postgraduate, B.BAŞARIR(Student), 2019

Dirik A. E., Deep learning based forensic applications, Postgraduate, A.GÖKHAN(Student), 2019

Dirik A. E., Source device attribution for digital videos, Postgraduate, E.KIEGAING(Student), 2018

Dirik A. E., Deep learning based vehicle make and model classification, Postgraduate, B.SATAR(Student), 2018

DİRİK A. E., Eye-blink based driver fatigue assessment system design, Postgraduate, S.KARAGÜLMEZ(Student), 2017

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Sub-Pixel Counting Based Diameter Measurement Algorithm for Industrial Machine Vision**
Gökhan Poyraz A., Kaçmaz M., Gürkan H., Dirik A. E.
MEASUREMENT: JOURNAL OF THE INTERNATIONAL MEASUREMENT CONFEDERATION, vol.225, no.114063, pp.1-19, 2023 (SCI-Expanded)
- II. **A One-Dimensional Convolutional Neural Network-Based Method for Diagnosis of Tooth Root Cracks in Asymmetric Spur Gear Pairs**
Kalay O. C., Karpat E., Dirik A. E., Karpat F.
MACHINES, vol.11, no.4, 2023 (SCI-Expanded)
- III. **The Effect of Inverse Square Law of Light on ENF in Videos Exposed by Rolling Shutter**
Vatansever S., DİRİK A. E., Memon N.
IEEE Transactions on Information Forensics and Security, vol.18, pp.248-260, 2023 (SCI-Expanded)
- IV. **ENF based Robust Media Time-Stamping**
Vatansever S., Dirik A. E., Memon N.
IEEE SIGNAL PROCESSING LETTERS, vol.2022, pp.1963-1967, 2022 (SCI-Expanded)
- V. **Analysis of Rolling Shutter Effect on ENF-Based Video Forensics**
Vatansever S., DİRİK A. E., Memon N.
IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, vol.14, no.9, pp.2262-2275, 2019 (SCI-Expanded)
- VI. **PRNU based source camera attribution for image sets anonymized with patch-match algorithm**
KARAKÜÇÜK A., DİRİK A. E.
DIGITAL INVESTIGATION, vol.30, pp.43-51, 2019 (SCI-Expanded)
- VII. **PRNU-based source device attribution for YouTube videos**
Kouokam E. K., DİRİK A. E.

DIGITAL INVESTIGATION, vol.29, pp.91-100, 2019 (SCI-Expanded)

- VIII. **Detecting the Presence of ENF Signal in Digital Videos: A Superpixel-Based Approach**
Vatansever S., DİRİK A. E., Memon N.
IEEE SIGNAL PROCESSING LETTERS, vol.24, no.10, pp.1463-1467, 2017 (SCI-Expanded)
- IX. **Evaluation of electromagnetic shielding effectiveness of fabrics produced from yarns containing metal wire with a mobile based measurement system**
ÇEVEN E. K., KARAKÜÇÜK A., DİRİK A. E., YALÇIN U.
INDUSTRIA TEXTILA, vol.68, no.4, pp.289-295, 2017 (SCI-Expanded)
- X. **Adaptive photo-response non-uniformity noise removal against image source attribution**
KARAKÜÇÜK A., DİRİK A. E.
DIGITAL INVESTIGATION, vol.12, pp.66-76, 2015 (SCI-Expanded)
- XI. **Analysis of Seam-Carving-Based Anonymization of Images Against PRNU Noise Pattern-Based Source Attribution**
DİRİK A. E., SENCAR H. T., Memon N.
IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, vol.9, no.12, pp.2277-2290, 2014 (SCI-Expanded)
- XII. **Forensic use of photo response non-uniformity of imaging sensors and a counter method**
Dirik A. E., Karaküçük A.
OPTICS EXPRESS, vol.22, no.1, pp.470-482, 2014 (SCI-Expanded)
- XIII. **Copy detection pattern-based document protection for variable media**
DİRİK A. E., Haas B.
IET IMAGE PROCESSING, vol.6, no.8, pp.1102-1113, 2012 (SCI-Expanded)
- XIV. **Digital single lens reflex camera identification from traces of sensor dust**
Dirik A. E., Senear H. T., Memon N.
IEEE Transactions on Information Forensics and Security, vol.3, pp.539-552, 2008 (SCI-Expanded)
- XV. **Steganalytic features for JPEG compression-based perturbed quantization**
Gul G., Dirik A. E., Avcibas I.
IEEE SIGNAL PROCESSING LETTERS, vol.14, no.3, pp.205-208, 2007 (SCI-Expanded)

Articles Published in Other Journals

- I. **Fault Classification of Wind Turbine Gearbox Bearings Based on Convolutional Neural Networks**
KARPAT F., Kalay O. C., DİRİK A. E., KARPAT E.
Transdisciplinary Journal of Engineering and Science, vol.13, pp.71-83, 2022 (Scopus)
- II. **The effect of light source on ENF based video forensics**
Vatansever S., Dirik A. E.
Uludağ Üniversitesi Mühendislik Fakültesi Dergisi, vol.22, no.1, pp.53-64, 2017 (Peer-Reviewed Journal)
- III. **Measurement of Electromagnetic Shielding Effectiveness of Woven Fabrics Containing Metallic Yarns by Mobile Devices**
ÇEVEN E. K., Karaman Ö. F., DİRİK A. E.
Uludağ University Journal of The Faculty of Engineering, vol.21, no.2, pp.85-94, 2016 (Peer-Reviewed Journal)
- IV. **A Novel Approach for Security Analysis of Graphical Passwords**
Dirik A. E.
Uludağ University Journal of The Faculty of Engineering and Architecture, vol.11, no.2, pp.23-32, 2006 (Peer-Reviewed Journal)
- V. **Genetic based road selection for tracking systems**
DİRİK A. E., YENİKAYA G.
ISTANBUL UNIVERSITY-JOURNAL OF ELECTRICAL AND ELECTRONICS ENGINEERING, vol.5, no.2, pp.1385-1390, 2005 (ESCI)

Books & Book Chapters

I. Selective Robust Image Encryption for Social Networks

Dirik A. E., Memon N.

in: Multimedia Communications, Services and Security, MCSS 2013, Dziech, Czyżewski, Editor, Springer, Berlin, Heidelberg, Krakow, pp.71-81, 2013

II. Source Attribution Based on Physical Defects in Light Path

Dirik A. E.

in: Source Attribution Based on Physical Defects in Light Path, Husrev Taha Sencar, Nasir Memon, Editor, Springer, London/Berlin, New York, pp.219-236, 2013

Refereed Congress / Symposium Publications in Proceedings

I. A Deep Learning-Based Method For Early Crack Diagnosis In Non-Standard Spur Gear Pairs

Kalay O. C., KARPAT F., KARPAT E., DİRİK A. E., Ekwaro Osire S.

ASME 2023 International Mechanical Engineering Congress and Exposition, IMECE 2023, New Orleans, United States Of America, 29 October - 02 November 2023

II. Fault Diagnosis of Rolling Bearing Under Variable Operating Conditions Based on Deep Learning

Karpat F., Kalay O. C., Dirik A. E., Karpat E.

10th International Scientific Conference on Research and Development of Mechanical Elements and Systems, Belgrade, Serbia, 26 May 2022, pp.148-155

III. Fault Diagnosis With Deep Learning for Standard and Asymmetric Involute Spur Gears

KARPAT F., DİRİK A. E., KALAY O. C., YÜCE C., DOĞAN O., KORCUKLU B.

ASME 2021 International Mechanical Engineering Congress and Exposition, United States Of America, 01 November 2021, vol.1314029

IV. Convolutional neural networks based rolling bearing fault classification under variable operating conditions

KARPAT F., Kalay O. C., DİRİK A. E., Dogan O., KORCUKLU B., Yuce C.

2021 International Conference on INnovations in Intelligent SysTems and Applications, INISTA 2021, Kocaeli, Turkey, 25 - 27 August 2021

V. Rolling Bearing Fault Diagnosis Under Variable Working Conditions with Artificial Intelligence

Karpat F., Dirik A. E., Kalay O. C.

International Conference on Interdisciplinary Applications of AI (ICIDAAI), Yalova, Turkey, 21 - 23 May 2021, pp.1-5

VI. A Novel AI-Based Method for Spur Gear Early Fault Diagnosis in Railway Gearboxes

KARPAT F., DİRİK A. E., Doğan O., Kalay O. C., KORCUKLU B., YÜCE C.

2020 Innovations in Intelligent Systems and Applications Conference (ASYU), Istanbul, Turkey, Turkey, 15 - 17 October 2020

VII. Deep Learning Based And Pid Control Based Autonomous Vehicle Systems

Aki K., Dirik A. E.

ICAIAME, Antalya, Turkey, 9 - 11 October 2020, pp.306-316

VIII. Vibration-based early crack diagnosis with machine learning for spur gears

KARPAT F., DİRİK A. E., Kalay O. C., Doan O., KORCUKLU B.

ASME 2020 International Mechanical Engineering Congress and Exposition, IMECE 2020, Virtual, Online, 16 - 19 November 2020, vol.7B-2020

IX. End-to-End Autonomous Vehicle Training

Aki K., Dirik A. E.

Elektrik, Elektronik Mühendisliği Kongresi, Elektronik ve Yeni Teknolojiler Sempozyumu, EEMKON, İstanbul, Turkey, 14 November - 16 December 2019

X. Source Device Attribution of Thermal Images Captured with Handheld IR Cameras

KARAKÜÇÜK A., DİRİK A. E.

11th International Conference on Electrical and Electronics Engineering (ELECO), Bursa, Turkey, 28 - 30 November 2019, pp.547-551

- XI. **FACTORS AFFECTING ENF BASED TIME-OF-RECORDING ESTIMATION FOR VIDEO**
Vatansever S., Dirik A. E., Memon N.
44th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Brighton, United Kingdom, 12 - 17 May 2019, pp.2497-2501
- XII. **Deep Learning Based Vehicle Make-Model Classification**
Satar B., DİRİK A. E.
27th International Conference on Artificial Neural Networks (ICANN), Rhodes, Greece, 4 - 07 October 2018, vol.11141, pp.544-553
- XIII. **A New Evaluation Method for Electromagnetic Shielding Effectiveness in Textiles**
Çeven E. K., Karaküçük A., Dirik A. E., Yalçın U.
UTİB Tekstil ve Konfeksiyon Sektöründe VIII. Uluslararası AR-GE Proje Pazarı, Bursa, Turkey, 12 - 13 May 2016, pp.171-172
- XIV. **Forensic Analysis of Digital Audio Recordings based on Acoustic Mains Hum**
Vatansever S., DİRİK A. E.
24th Signal Processing and Communication Application Conference (SIU), Zonguldak, Turkey, 16 - 19 May 2016, pp.1285-1288
- XV. **Recent Advances in Counter PRNU Based Source Attribution and Beyond**
Karaküçük A., Dirik A. E., Sencar H. T., Memon N. D.
Conference on Media Watermarking, Security, and Forensics, San-Francisco, Costa Rica, 9 - 11 February 2015, vol.9409
- XVI. **Selective Robust Image Encryption for Social Networks**
DİRİK A. E., Memon N.
6th International Conference on Multimedia Communications, Services and Security (MCSS), Krakow, Poland, 6 - 07 June 2013, vol.368, pp.71-81
- XVII. **An Ensemble of Classifiers Approach to Steganalysis**
Sevinç B., DİRİK A. E., SENCAR H. T., Nasir M.
20th International Conference on Pattern Recognition, İstanbul, Turkey, 23 - 26 August 2010, pp.4376-4379
- XVIII. **Source class identification for DSLR and compact cameras**
Fang Y., Dirik A. E., Sun X., Memon N.
2009 IEEE International Workshop on Multimedia Signal Processing, MMSP '09, Rio de Janeiro, Brazil, 5 - 07 October 2009
- XIX. **Image Tamper Detection Based on Demosaicing Artifacts**
DİRİK A. E., Nasir M.
IEEE International Conference on Image Processing, ICIP 09, Cairo, Egypt, 7 - 10 November 2009, pp.1497-1500
- XX. **Flatbed scanner identification based on dust and scratches over scanner platen**
DİRİK A. E., SENCAR H. T., Nasir M.
IEEE Int. Conference on Acoustics, Speech, and Signal Processing, ICASSP 09, Taipei, Taiwan, 19 - 24 April 2009, pp.1385-1388
- XXI. **New Features to Identify Computer Generated Images**
DİRİK A. E., Sevinç B., SENCAR H. T., Nasir M.
2007 IEEE International Conference on Image Processing, San Antonio, TX, USA, United States Of America, 16 September - 19 October 2007, pp.433-436
- XXII. **Modeling User Choice in the PassPoints Graphical Password Scheme**
DİRİK A. E., Nasir M., J C B.
Symposium On Usable Privacy and Security, SOUPS, Pittsburgh, United States Of America, 18 - 20 July 2007, pp.20-28
- XXIII. **Steganalysis of perturbed quantization**
Gul G., DİRİK A. E., Avcibas I.

Other Publications

I. Fusion of Camera Model and Source Device Specific Forensic Methods for Improved Tamper Detection

Poyraz A. G., Dirik A. E., Karaküçük A., Memon N.
Other, pp.1-13, 2020

Supported Projects

Dirik A. E., TUBITAK Project, IMAGINE - Generative Deep Network Based Pattern Design Software, TEYDEB 1501, 2023 - 2025

Karaküçük A., Dirik A. E., TUBITAK Project, A Novel PRNU-Based Approach for Identifying the Source Camera in Panoramic Photos, 2024 - 2024

Dirik A. E., TUBITAK Project, Leo Fabric Vision - Error Detection and Analysis System for Fabrics Flowing on Quality Control Tables Using Deep Learning and Weft-Warp Density, TEYDEB 1501, 2023 - 2024

KARPAT F., DİRİK A. E., KARPAT E., KALAY O. C., Project Supported by Higher Education Institutions, Standart ve Asimetrik Dişli Çarklarda Diş Dibi Çatlak Hasarı ve Derecesinin Makine Öğrenmesi ile Deneysel Olarak Tespiti, 2021 - 2023

Karaalp H. I., Dirik A. E., TUBITAK Project, Development of Mass Production Process Analysis Software Supported by Artificial Intelligence and Mixed Reality Hardware, TEYDEB 1501, 2021 - 2022

Yonar T., Dirik A. E., Başaran Ö. F., Bice Çalışkan A., TUBITAK Project, Development of Domestic and National Ultrasonic Doppler Flowmeter System That Can Be Used in Wastewater, TEYDEB 1507, 2021 - 2022

Dirik A. E., Akın O., TUBITAK Project, Automatic Detection of Personal Data in Digital Document and Image Files, TEYDEB 1501, 2020 - 2021

Dirik A. E., Delp E., Memon N., Project Supported by Public Organizations in Other Countries, Media Forensics Integrity Analytics, DARPA , 2016 - 2020

Dirik A. E., Akın O., TUBITAK Project, Visitor Tracking and Demographic Analysis with Facial Recognition Technology, TEYDEB 1507, 2018 - 2019

Dirik A. E., Eryılmaz O., TUBITAK Project, Development of Active Noise Cancellation System, TEYDEB 1501, 2017 - 2019

Dirik A. E., Koç A., Project Supported by Defense Industry, PRNU Sensor Noise Based Source Device Attribution in Digital Video Files, 2017 - 2019

Dirik A. E., Kaya B., TUBITAK Project, Development of a Laser Measurement System for Akbant Presses, TEYDEB 1501, 2015 - 2017

Dirik A. E., TUBITAK Project, Anonymization of Digital Images Against Source Camera Attribution, TUBİTAK 1002 , 2013 - 2014

Patent

Dirik A. E., Eğri S., Somuncuoğlu D., A System and Method That Performs Weft and Warp Counting With Multiple Thresholding In The Textile Industry, Patent, CHAPTER A Human Needs, The Invention Recourse Number: PCT/TR2024/051236 , Standard Registration, 2024

Dirik A. E., Eğri S., Somuncuoğlu D., A System and Method That Performs Weft and Warp Counting With Multiple Thresholding In The Textile Industry, Patent, CHAPTER A Human Needs, The Invention Recourse Number: 2023/019589 , Standard Registration, 2023

Dirik A. E., Karaküçük A., Source Camera Sensor Fingerprint Generation Method From Panorama Images, Patent, CHAPTER A Human Needs, The Invention Registration Number: 2021/018005 , Standard Registration, 2022

Karaküçük A., Dirik A. E., Source Camera Sensor Fingerprint Generation Method From Panorama Images, Patent, CHAPTER G Physics, The Invention Recourse Number: PCT/TR2021051391 , Standard Registration, 2023, 2021

Dirik A. E., Yavuzkasap Ayakta D., A method for detecting warp and weft regions in woven fabrics., Patent, CHAPTER G Physics, The Invention Registration Number: 2020/08745 , Standard Registration, 2021

Dirik A. E., Vatansever S., A method that provides information on whether the electrical grid frequency signal is embedded in a video analyzed within the scope of forensic evidence, Patent, CHAPTER G Physics, The Invention Registration Number: 2016 14117 , Standard Registration, 2020

Karaküçük A., Dirik A. E., Anonymization system and method for digital images, Patent, CHAPTER G Physics, The Invention Registration Number: US10297011B2 , Standard Registration, 2019

Ayakta D., Dirik A. E., A method for detecting weft and warp regions in woven fabrics, Patent, CHAPTER D Textile; Paper, The Invention Recourse Number: PCT/TR2017/050729 , Standard Registration, 2017

Dirik A. E., Karaküçük A., Anonymization system and method for digital images, Patent, CHAPTER G Physics, The Invention Registration Number: 2013 04116 , Standard Registration, 2016

Bayram S., Dirik A. E., Memon N., Topkara U., User authentication for devices with touch sensitive elements, such as touch sensitive display screens, Patent, CHAPTER G Physics, The Invention Registration Number: US8941466B2 , Standard Registration, 2015

Dirik A. E., Topkara M., Lai J., Automatic static video summarization, Patent, CHAPTER G Physics, The Invention Registration Number: US8687941B2 , Standard Registration, 2014

Haas B., Dirik A. E., Nawaz Y., Image encryption for print-and-scan channels using pixel position permutation, Patent, CHAPTER G Physics, The Invention Registration Number: US8705736B2 , Standard Registration, 2014

Haas B., Dirik A. E., System and method for paper independent copy detection pattern, Patent, CHAPTER G Physics, The Invention Registration Number: US8335744B2 , Standard Registration, 2012

Metrics

Publication: 49
Citation (WoS): 543
Citation (Scopus): 806
H-Index (WoS): 13
H-Index (Scopus): 14

Awards

Dirik A. E., Karaküçük A., National Patent Registration Award, Tübitak, February 2021

Dirik A. E., Karaküçük A., 4th Istanbul International Inventions Fair (ISIF'19) Bronze Medal, Türk Patent Ve Marka Kurumu, September 2019

Dirik A. E., Project Performance Award, Tübitak, March 2019

Dirik A. E., Karaküçük A., 3rd TET R&D Project Market, Information and Communication Technology Applications, Second Prize, Elektrik Elektronik Ve Hizmet Ihracatçıları Birliği, March 2014

Dirik A. E., CSAW-2007 Research Poster Competition, 3rd Prize, Polytechnic University, New York, November 2007

Non Academic Experience

IBM, T. J. Watson Research Center, NY, (USA),
Pitney Bowes, Adv. Concepts and Tech., (USA),
Pitney Bowes, Adv. Concepts and Tech., (USA),