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CURRENT POSITION

- *Scientific Expert at Center for Image Analysis of Middle East Technical University, Ankara, 06800, Turkey.*

RESEARCH TOPICS

- Hyperspectral Image Processing and Analysis: Target Detection, Change Detection, Unmixing, Anomaly Detection, and Classification
- High Dynamic Range Image Processing and Analysis: Tone Mapping, Coding, Inverse Tone Mapping, HDR Image Perception, Object Detection and Classification
- Multimedia Security: Watermarking, Perceptual Hashing, Content based Identification and Indexing in Distributed Networks

ACADEMIC TITLE

- Associate Professor Title in Electrical and Electronics Engineering given by Interuniversity Council Presidency of Turkey (Date: 16.12.2020).

EDUCATION

- **Doctor of Philosophy, Electrical and Electronics Engineering (EEE)**
Middle East Technical University (METU), Ankara, TURKEY
Period: September 2002 – August 2007
Major: Signal Processing
Ph.D. Dissertation Topic: Watermarking for 3D Representations
Advisor: Prof. A. Aydın Alatan
- **Master of Science, Electrical and Electronics Engineering**
Middle East Technical University, Ankara, TURKEY
Period: September 2000 – September 2002
Major: Signal Processing
Master's thesis: Digital Watermarking based on Human Visual System
Advisor: Prof. A. Aydın Alatan
- **Bachelor of Science, Electrical and Electronics Engineering,**
Middle East Technical University, Ankara, TURKEY
Period: September 1996 – June 2000
Majors: Signal Processing, Telecommunications, Control Engineering
- **Izmir Science High School, Izmir, TURKEY**
Period: September 1993 – June 1996
Majors: Science and Math

RESEARCH EXPERIENCE

Research at Center for Image Analysis of METU (April 2014- Current)

- **Principal Investigator of an international project on Covid Detection with Hyperspectral Image Analysis (June 2022 – Current).** The project is supported by and collaborated with Health Science Center of The University of Tennessee (USA).
- **Chief Senior Researcher and Co-administrator of an international project (April 2020 – February 2022)** entitled “H3DR Camera: Smart embedded camera with multi-exposure & multi-view capability for autonomous vehicles”, supported by the Royal Academy of Engineering of United Kingdom. The partner university of the project in UK is University of Warwick. The primary goal of the project is to develop a novel, prototype multi-view and multi-exposure intelligent camera unit that would serve as a highly reliable visual sensor. This would be robust to natural illumination variations in the scene and thus well-suited to autonomous vehicles. A further key objective is to pro-actively disseminate the developed, validated technology of this imaging system to all stakeholders, including industry, government, NGOs and academia by workshops, graduate course and seminars, to clearly raise awareness of the substantial benefits of multi-view, multi-exposure intelligent camera unit to future autonomous vehicles.
- **Chief Senior Researcher and Co-administrator (September 2019 - October 2021)** of a national project, entitled “Remote Detection of Illegal Electricity Usage with Multi-Sensor Imaging” supported by Energy Market Regulatory Authority of Turkey. The first objective of the project is to reveal the potential of four different sensors, namely hyperspectral, LIDAR, thermal, and electro-optic, mounted on an unmanned aerial vehicle for detection and classification of illegal electrical transformers and their second level indicators, such as orthogonal electrical lines to the power lines, water pumps, and water and drainage channels. The second objective is to fuse the detection probability maps for all modalities by means of a deep network and hence, to obtain an ultimate detection probability map for the illegal transformers in order to support the operational teams in the field.
- **Consultant (September 2020 - September 2021)** for a national project, entitled “Hyperspectral Unmixing of Gases with Deep Learning” supported by *The Scientific and Technological Research Council of Turkey (TÜBİTAK)*. The project aims to develop hyperspectral unmixing algorithms with deep learning for detection and classification of gases in longwave infrared (LWIR) spectrum. It examines the effect of the number and type of the hidden layers on the algorithm performance as well as the performance variations with respect to different distance metrics during the computation of cost function. In addition, the investigation includes the performance comparisons for different types of gases.
- **Principal Investigator (March 2016-February 2020)** at the Turkish side of an international project entitled "Backward Compatible and Native Encoding of High Dynamic Range Video and Its Perceptual Evaluation", supported by TÜBİTAK and the *French Ministry of Foreign Affairs* under the Programme of Integrated Actions-Bosphorus. The partner and the PI of the project at

French side is *Laboratoire Traitement et Communication de l'Information* (LTCI) of Telecom ParisTech-CNRS and Dr. Giuseppe Valenzise, respectively. The first objective of the project is to design a high dynamic range image and video coding system which is backward compatible to existing standard 8-bit displays in order to enable a successful transition from low dynamic range (LDR) to high dynamic range (HDR) technology. The second objective is to design a system for the native (direct) encoding of HDR video by investigating the contrast sensitivity and quantization levels of human visual system for high luminance patterns by using prototype HDR displays with a luminance level up to 4000 cd/m².

- **Principal Investigator (May 2016-December 2019)** for METU activities in NATO SET 240 panel, “Exploitation of Longwave Infrared Airborne Hyperspectral Data”. Participating nations in the panel are Belgium, Canada, Germany, Netherlands, Norway, USA, Sweden and Turkey. The research objectives of METU are the development of new methods for target rediscovery and the comparison of different modalities for detection including radiance, reflectance, and emissivity spectra in short wave infrared (SWIR) and long wave infrared (LWIR) hyperspectral images. *The publication in the panel is subject to the permission of data and experiment owners.*
- **National Representative (November 2016-December 2019)** of Turkey assigned by Defense Department in NATO SET 240 panel responsible from the coordination of Turkey participants (METU, Hacettepe University, Tübitak Space Technologies Research Institute, Aselsan, and Havelsan), work division among the participants, and security of the shared hyperspectral data for the panel.
- **Chief Senior Researcher (September 2016-December 2018)** in a defense supported project on the detection of chemical materials with hyperspectral techniques. The ultimate goal of the project is to develop a ground based hyperspectral image surveillance system for detection of car bombs in dynamic scenes. The main parts of the project include (i) the state-of-the-art of hyperspectral detection systems considering the suitability of the existing methods for the surveillance of, not only static scenes, but also dynamic scenes, (ii) development of radiance to reflectance conversion methods for generic practical hyperspectral image surveillance systems to compensate the usage of white references at every capturing instant, (iii) the comparison of the target detection methods, namely, signature based target detection methods, index based methods, and learning based methods, for the detection of explosives in “solid” and “soluble” forms, and (iv) the regulation and registration of the spectral bands for a dynamic scene with a moving vehicle. *The publication on the military aspect of the project is subject to the permission of collaborated defense company.*
- **Scientific Expert (March 2016-August 2016)** in a defense supported project on the registration of same-band and different-band hyperspectral images. *The project is closed to publication.*
- **Scientific Expert (April 2014 - October 2015)** in a defense supported project on hyperspectral image analysis focusing on the development and performance evaluation of new signature based target detection methods, anomaly detection

methods, and unmixing techniques for defense applications. *The project is closed to publication.*

Previous Research

- **Postdoctoral Researcher in *Multimedia Group, Signal and Image Processing Department (TSI), Telecom ParisTech, Paris, France (1 October 2011 – 31 July 2013)***: His main research topic was to develop high dynamic range (HDR) image and video coding methods which are backward compatible to standard low dynamic range (LDR) displays in order to provide a smooth transition from LDR technology to HDR technology. More specifically, he worked on optimized tone mapping algorithms which minimize the perceptual HDR metrics between the original and encoded HDR content, and produce pleasant LDR views with a desired minimum quality at the same time.
- **Postdoctoral Researcher in *Laboratory Signals and Systems, SUPELEC, Paris, France (3 May 2010 – 31 August 2011)***: His main focus was to develop audio watermarking techniques in compressed domain for audio downloading applications in exchange networks. As the audio files are stored in the coded form at the server side, a watermarking approach directly working on the compressed spectrum coefficients removes the necessity for full decoding and hence, increases the efficiency during streaming. He investigated the optimum watermark embedding locations in the spectrum of audio files in the trade-off between robustness, imperceptibility and payload in order to enable the automation of watermarking processes for large databases.
- **Postdoctoral Researcher (10 January 2008 – 01 March 2010) in *Multimedia Signal Processing Group, Delft University of Technology, The Netherlands***: The main topic in his post-doctoral study was content based identification in peer-to-peer (P2P) networks. He developed a distributed video copy detection system based on perceptual hashes in P2P networks considering the different requirements originating from the characteristics of ordinary internet users, such as lower computational power, lower storage size and lower bandwidth, compared to the previous copy detection applications based on central servers.
- **Intern Researcher (16 August 2006 – 15 February 2007) at *Adastral Park Postgraduate Researches and Teaching Campus, University College London, England***: His main research topic in this visit was 3D object watermarking by means of modifications on projective invariants. He developed a novel 3D-2D watermarking method, in which a watermark is embedded into 3-D representation of the object and detected from a 2-D projection (image) of the same model. The visit was supported by The Scientific and Technological Research Council of Turkey under International Research Fellowship Programme.
- **Intern Researcher (March 2006) at *Informatics and Telematics Institute (ITI) of CERTH, Thessaloniki, Greece***: He studied the watermarking methods for geometrical representations of 3D models. This study pointed out the specific problems in 3D-3D geometry watermarking, such as the lack of a unique 3D scene representation, standardization for the coding schemes, and

benchmarking tools on 3D geometry watermarking compared to the conventional image and video watermarking. The visit was supported by 3DTV project, a Network of Excellence funded by the European Commission 6th Framework Information Society Technologies Programme.

- **Research Assistant (October 2004 – October 2007, EEE Department, METU, Ankara, Turkey)** in the project, *Integrated Three Dimensional Television (3D TV) Capture, Transmission and Display*. 3DTV is a Network of Excellence funded by the European Commission 6th Framework Information Society Technologies Programme. His research topic in the project was to develop watermarking methods for image-based and geometry-based representations of 3D scenes.
- **Research Assistant (June 2004 – August 2004, EEE Department, METU, Ankara, Turkey)** in the project, *I-rate*. The project aims to monitor the broadcast of advertisements in Turkey by means of watermarking. The project is supported by The Scientific and Technical Research Council of Turkey (TÜBİTAK).
- **Research Assistant (October 2001 – September 2002, EEE Department, METU, Ankara, Turkey)** in the project, *Watermarking and Data Hiding for non-secure Applications*. The project is supported by The Scientific and Technical Research Council of Turkey (TÜBİTAK) under project EEEAG 101E007.

TEACHING EXPERIENCE

Courses Given

- **EE 209, Fundamentals of Electrical Engineering, (Fall 2014-2105, Spring 2014-2015, Fall 2015-2016, Spring 2015-2016, EEE Department, METU, Ankara, Turkey):** Basics of Electricity, Circuit Analysis Methods, Node Analysis, Mesh Analysis, DC Steady State Analysis, AC Steady State Analysis, Phasors, Power, Complex Power, Power Compensation, Operational Amplifier Circuits.

Teaching Assistantship

- Teaching Assistant (EEE, METU, Ankara, Turkey, *Fall 2000 – Spring 2007*) of *Basic Circuit Laboratory I-II* and *Circuit Theory I-II* courses.
- Teaching Assistant (EEE, METU, Ankara, Turkey, *Fall 2002, Fall 2003*) of *Digital Signal Processing* course.
- Coordinator Teaching Assistant (EEE, METU, Ankara, Turkey, *Spring 2005, Fall 2005*) of *Basic Circuit Laboratory* courses.
- Update of laboratory manuals for *Basic Circuit Laboratory I-II* courses (EEE, METU, Ankara, Turkey, *Fall 2005-Spring 2006*).
- Construction of the circuit laboratory in METU Cyprus Campus (Fall 2005).

PUBLICATIONS

(**J**: Journal, **B**: Book Chapter, **P**: Patent, **LNCS**: Lecture Notes on Computer Science, **C**: Conference, **NC**: National Conference, **XR**: Paper in Revision, **XS**: Paper Submitted)

Hyperspectral Image Processing and Analysis

- [J1] Mustafa Kütük, İzlen Geneci, Okan Bilge Özdemir, Alper Koz, Okan Esentürk, Yasemin Yardımcı Çetin, and A. Aydın Alatan "Ground-Based Hyperspectral Image Surveillance System for Explosive Detection: Methods, Experiments, and Comparisons," in IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 16, pp. 8747-8763, 2023
- [J2] Okan Bilge Özdemir and A. Koz, "3D-CNN and Autoencoder-Based Gas Detection in Hyperspectral Images," in IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 16, pp. 1474-1482, 2023.
- [J3] Okan Bilge Özdemir, Alper Koz and Yasemin Yardımcı Çetin, "Non-linear hyperspectral unmixing with 3D convolutional encoders," International Journal of Remote Sensing, 43:9, 3236-3257, 2022.
- [J4] Alper Koz, "Ground-Based Hyperspectral Image Surveillance Systems for Explosive Detection: Part I—State of the Art and Challenges", IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing, vol. 12, no.12, pp. 4746 - 4753, Dec. 2019.
- [J5] Alper Koz, "Ground-Based Hyperspectral Image Surveillance Systems for Explosive Detection: Part II—Radiance to Reflectance Conversions", IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing, vol. 12, no.12, pp. 4754 - 4765, Dec. 2019.
- [J6] Hilal Soydan, Alper Koz, and H. Şebnem Düzgün, "Identification of Hydrocarbon Microseepage Alterations with Spectral Target Detection and Unmixing Algorithms", International Journal of Applied Earth Observation and Geoinformation, vol. 74, pp.209-221, February 2019.
- [J7] D. Cagdas Demirkan, Alper Koz, and H. Sebnem Düzgün, "Hierarchical classification of Sentinel 2-a images for land use and land cover mapping and its use for the CORINE system," Journal of Applied Remote Sensing 14(2), 026524, June 2020.
- [J8] Hilal Soydan, Alper Koz and H. Şebnem Düzgün, "Secondary Iron Mineral Detection via Hyperspectral Unmixing Analysis with Sentinel 2 Imagery," International Journal of Applied Earth Observation and Geoinformation, vol. 101, September 2021. (DOI: <https://doi.org/10.1016/j.jag.2021.102343>)
- [J9] Alper Koz and Ufuk Efe, "Geometric and Optimization-based Registration Methods for Long-wave Infrared Hyperspectral Images," Remote Sensing, vol. 13, June 2021. (DOI: <https://doi.org/10.3390/rs13132465>)
- [C1] Metehan Yalçın, Seniha Esen Yüksel Erdem, and Alper Koz, "Target Detection with LWIR Hyperspectral Scene Transfer based on Deep Learning", IEEE Geoscience and Remote Sensing Symposium (IGARSS 2024), Athens, Greece, 7-12 July 2024.

- [C2] İlke Belenoğlu, Metehan Yalçın, Seniha Esen Yüksel Erdem, and Alper Koz, “Target Detection over Temperature Profiles”, IEEE Geoscience and Remote Sensing Symposium (IGARSS 2022), Kuala Lumpur, Malesia, 17-22 July 2022, pp. 1237-1240.
- [C3] Alper Koz and A. Aydın Alatan, “Registration methods via 3D-2D Conversions for Long-wave Infrared Hyperspectral Images”, NATO SET-277 Inter-Panel / Inter-Group Workshop on “Phenomenology and Exploitation of Hyperspectral Sensing within NATO“, October 2019, Brussels, Belgium.
- [C4] Alper Koz, İlke Belenoğlu, Mustafa Kütük, Seniha Esen Yüksel and A. Aydın Alatan, “Target Rediscovery on Long-wave Infrared Hyperspectral Images using Radiance and Emissivity Data”, NATO SET-277 Inter-Panel / Inter-Group Workshop on “Phenomenology and Exploitation of Hyperspectral Sensing within NATO“, October 2019, Brussels, Belgium.
- [C5] Bahar Taskesen, Alper Koz, A. Aydın Alatan Alatan, and Oliver Weatherbee, “Change Detection for Hyperspectral Images Using Extended Mutual Information and Oversegmentation”, IEEE 9th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Amsterdam, The Netherlands, September 2018.
- [C6] Mustafa Kütük, Alper Koz, A. Aydın Alatan, “Hyperspectral target detection by using superpixels and signature based methods”, IEEE 9th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Amsterdam, The Netherlands, September 2018.
- [C7] Hilal Soydan, Alper Koz, H. Sebnem Düzgün, “Spatio-temporal anomaly detection for environmental impact assessment: a case of an abandoned coal mine site in Turkey”, Remote Sensing and Modeling of Ecosystems for Sustainability XIV, SPIE, 2017.
- [C8] Alper Koz, Akın Çalışkan, A. Aydın Alatan, “Registration of Hyperspectral Image Registration”, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Los Angeles, USA, August 2016.
- [C9] Hilal Soydan, Alper Koz, H. Şebnem Düzgün, and A. Aydın Alatan, “Total Carbon Mapping with Hyperspectral Unmixing Techniques”, IEEE 8th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Los Angeles, USA, August 2016.
- [C10] Alper Koz, Hilal Soydan, H. Şebnem Düzgün, and A. Aydın Alatan, “A local extrema based method on 2D brightness temperature maps for detection of archeological artifacts”, in Proc. of IEEE Geoscience and Remote Sensing Symposium (IGARSS), Beijing, China, July 2016.
- [C11] Akın Çalışkan, Emrehan Batı, Alper Koz, and A. Aydın Alatan, “Superpixel based hyperspectral target detection”, in Proc. of IEEE Geoscience and Remote Sensing Symposium (IGARSS), Beijing, China, July 2016.
- [C12] Emrehan Batı, Akın Çalışkan, Alper Koz, and A. Aydın Alatan, “Hyperspectral Anomaly Detection Method Based on Autoencoder”, in Proc. SPIE 9643, Image and Signal Processing for Remote Sensing XXI, Toulouse, France, September 2015.

- [C13] Hilal Soydan, Alper Koz, H. Şebnem Düzgün, and A. Aydın Alatan, “Hydrocarbon Microseepage Mapping Using Signature Based Target Detection Techniques”, in Proc. SPIE 9644, Earth Resources and Environmental Remote Sensing/GIS Applications VI, Toulouse, France, September 2015.
- [C14] Hilal Soydan, Alper Koz, H. Şebnem Düzgün, and A. Aydın Alatan, “A Comparative Study of Hyperspectral Anomaly and Signature Based Target Detection Methods for Oil Spills”, in Proc. of IEEE 7th Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing, Tokyo, Japan, June 2015.
- [C15] Akın Çalışkan, Alper Koz, and A. Aydın Alatan, “Hyperspectral Superpixel Extraction Using Boundary Updates Based on Optimal Spectral Similarity Metric”, in Proc. of IEEE Geoscience and Remote Sensing Symposium (IGARSS), Milan, Italy, July 2015.
- [NC1] Bahar Taşkesen, Beril Beşbınar, Alper Koz, and A. Aydın Alatan, “Aşırı Bölütleme ve Ortak Bilgi ile Uydu Görüntülerinde Güdümsüz Değişiklik Tespiti”, 25. Sinyal İşleme ve İletişim Uygulamaları Kurultayı, 15-18 Mayıs 2017, Antalya. (Turkish)
- [NC2] Emrehan Batı, Acar Erdiñç, Davut Çeşmeci, Akın Çalışkan, Alper Koz, Selim Aksoy, Sarp Ertürk ve A. Aydın Alatan, “Çizge Kesit Yöntemiyle Hiperspektral Görüntülerde Anomali Tabanlı Hedef Tespiti”, IEEE 23. Sinyal İşleme ve İletişim Uygulamaları Kurultayı, 16-19 Mayıs 2015, Malatya. (Turkish)
- [NC3] Hilal Soydan, Alper Koz, H. Şebnem Düzgün ve A. Aydın Alatan, “Petrol Sızıntılarını Bulmada Hiperspektral Anomali ve İmza Tabanlı Hedef Tespit Algoritmalarının Karşılaştırılması”, IEEE 23. Sinyal İşleme ve İletişim Uygulamaları Kurultayı, 16-19 Mayıs 2015, Malatya. (Turkish)

High Dynamic Range Image Processing and Analysis

- [J1] Ismail Hakki Kocdemir, Alper Koz, Ahmet Oguz Akyuz, Alan Chalmers, Aydın Alatan, Sinan Kalkan, “TMO-Det: Deep tone-mapping optimized with and for object detection,” Pattern Recognition Letters, Volume 172, Pages 230-236, 2023.
- [J2] Alper Koz and Frederic Dufaux, “Methods for Improving the Tone Mapping for Backward Compatible High Dynamic Range Image and Video Compression”, Elsevier Signal Processing: Image Communication, vol. 29, no. 2, pp. 274-292, February 2014.
- [SP1] İsmail Hakkı Koçdemir, Alper Koz, Oğuz Akyüz, Alan Chalmers, A. Aydın Alatan, and Sinan Kalkan, " A high performance object detection system using HDR images acquired from LDR Cameras in Autonomous Vehicles", ***filed patent application*** for Turkey, December 2021. Application No: 2021/021665.
- [C1] Ismail Hakkı Kocdemir, Ahmet Oguz Akyuz, Alper Koz, Alan Chalmers, Aydın Alatan and Sinan Kalkan, "Object Detection for Autonomous Driving: High-Dynamic Range vs. Low-Dynamic Range Images," 2022 IEEE 24th International Workshop on Multimedia Signal Processing (MMSp), Shanghai, China, 2022, pp. 1-5.

- [C2] Alper Koz, Baris Demirkilic, Yunus Kurt, Oguz Akyuz, Sinan Kalkan, A. Aydın Alatan, and Alan Chalmers, “HDR Image Construction from trifocal Multiexposure Images”, IEEE 23rd International Workshop on Multimedia Signal Processing (IEEE MMSP 2021), Tampere, Finland, October 2021.
- [C3] Begum Sozer, Alper Koz, A. Oguz Akyuz, Emin Zerman, Giuseppe Valenzise, and Frederic Dufaux, “Just Noticeable Quantization Levels for High Dynamic Range Images”, in Proc. of IEEE International Conference on Image Processing (ICIP), 25-28 October 2020, Abu Dabi, United Arab Emirates.
- [C4] Kutun Feyiz, Fatih Kamisli, Emin Zerman, Giuseppe Valenzise, Alper Koz and Frederic Dufaux, “Statistical analysis and directional coding of layer-based HDR image coding residue”, in Proc. of IEEE 19th International Workshop on Multimedia Signal Processing (IEEE MMSP 2017), Bedfordshire, England, October 2017.
- [C5] Alper Koz and Frederic Dufaux, “Optimized Tone Mapping with LDR Image Quality Constraint for backward-compatible High Dynamic Range Image and Video Compression”, in Proc. of IEEE International Conference on Image Processing (ICIP), pp. 1762-1766, September 2013.
- [C6] Alper Koz and Frederic Dufaux, “Optimized Tone Mapping with Flickering Constraint for backward-compatible High Dynamic Range Image and Video Compression”, in Proc. of 14th International Workshop on Image and Audio Analysis for Multimedia Interactive Services (WIAMIS), pp. 1-4, July 2013.
- [C7] Paul Lauga, Alper Koz, Giuseppe Valenzise, and Frederic Dufaux, “Region-Based Tone Mapping for Efficient High Dynamic Range Video Coding”, in Proc. of 4th European Workshop on Visual Information Processing (EUVIP), pp. 208-213, June 2013.
- [C8] Paul Lauga, Alper Koz, Giuseppe Valenzise, and Frederic Dufaux, “Segmentation based Optimized Tone Mapping for High Dynamic Range Video Coding”, pp. 257-260, Picture Coding Symposium (PCS), 2013.
- [C9] Alper Koz and Frederic Dufaux, “A Comparative Survey on High Dynamic Range Video Compression”, in SPIE Proc. Applications of Digital Image Processing XXXV, Vol. 8499, 15 pp., August 2012.
- [C10] Alper Koz and Frederic Dufaux, “Optimized Tone Mapping with Perceptually Uniform Luminance Values for backward-compatible High Dynamic Range Video Compression”, in Proc. of IEEE Visual Communication and Image Processing Conference (VCIP), pp. 1-6, November 2012.
- [NC1] Begum Sozer, Alper Koz, A. Oguz Akyuz, Emin Zerman, Giuseppe Valenzise, and Frederic Dufaux, “An Experimental Method to Determine Quantization Levels for High Luminance Patterns”, 28th Conference on Signal Processing and Communications Applications, 20-22 April 2020, Gaziantep, Turkey.
- [NC2] Kutun Feyiz, Fatih Kamisli, Emin Zerman, Giuseppe Valenzise, Alper Koz and Frederic Dufaux, “Geriye Uyumlu YDO Görüntü Kodlama için Kalıntı Sinyalinin İstatiksel Analizi”, 25. Sinyal İşleme ve İletişim Uygulamaları Kurultayı, 15-18 Mayıs 2017, Antalya. (Turkish)

Multimedia Security:

Watermarking, Perceptual Hashing, Content based Identification and Indexing in Distributed Networks

- [J1] Alper Koz and R.(Inald) L. Lagendijk, “Distributed Content Based Video Identification in P2P Networks: Requirements and Solutions”, in *IEEE Transactions on Multimedia*, vol. 19, no. 3, pp. 475-491, March 2017.
- [J2] Alper Koz, “Distributed Video Identification with Perceptual Tags in Peer-to-Peer Networks”, *Anadolu University Journal of Science and Technology A- Applied Sciences and Engineering*, vol. 19, no. 1, pp. 132-143, 2018.
- [J3] Alper Koz, Cevahir Çiğla and A. Aydın Alatan, “Watermarking of Free View Video”, in *IEEE Transactions on Image Processing*, vol. 19, pp. 1785-1797, July 2010.
- [J4] Alper Koz and A. Aydın Alatan, “Oblivious Spatio-Temporal Watermarking of Digital Video by exploiting Human Visual System”, in *IEEE Transactions on Circuits, Systems and Video Technology*, vol. 18, pp. 326-337, March 2008.
- [J5] Aljoscha Smolic, Karsten Mueller, Nikolce Stefanoski, Joern Ostermann, Atanas Gotchev, Gozde B. Akar, Georgios Triantafyllidis, Alper Koz, "3D TV: Coding Algorithms for 3D TV-A Survey", in *IEEE Transactions on Circuits, Systems and Video Technology*, vol. 17, pp. 1606-1621, November 2007.
- [LNCS] Alper Koz and Claude Delpha, “Adaptive Selection of Embedding Locations for Spread Spectrum Watermarking of Compressed Audio”, *Digital Forensics and Watermarking, Lecture Notes in Computer Science*, vol. 7128, pp. 97-110, Springer 2012.
- [B] Alper Koz, George Triantafyllidis, and A. Aydın Alatan, “3D Watermarking: Techniques and Directions” in *Three-Dimensional Television: Capture, Transmission, and Display* (Ch. 12), Editors: Haldun M. Ozaktas and Levent Onural, Springer Verlag 2007.
- [P] Alper Koz, Cevahir Çiğla and A. Aydın Alatan “Watermark Detection Method for Broadcasting”, WO/2008/041061, Patent No: PCT/IB2006/053644, April 2008.
- [C1] Alper Koz and R.(Inald) L. Lagendijk, “Perceptual Tagging of Video files in Peer-to-Peer Networks”, in *Proc. of IEEE International Conference on Image Processing (ICIP)*, pp. 193-196, September 2010.
- [C2] Alper Koz and R. (Inald) L. Lagendijk, “Perceptual Video Hashing in Peer-to-Peer Networks”, in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, pp. 1842-1845, March 2010.
- [C3] Alper Koz, Cevahir Çiğla and A. Aydın Alatan, “Watermarking for Image Based Rendering via homography-based virtual camera location estimation”, in *Proc. of*

- IEEE International Conference on Image Processing (ICIP), pp. 1284-1287, October 2008.
- [C4] Alper Koz, Cevahir ıęla and A. Aydın Alatan, “Watermarking for Light Field Rendering”, in Proc. of European Signal Processing Conference (EUSIPCO), pp. 2296-2300, September 2007.
- [C5] Evlambios E. Apostolidis, Alper Koz and George Triantafyllidis, “Best Watermarking Selection for Free-View Point Television”, 14th International Conference on systems, Signals and Image Processing IWSSIP 2007 and 6th EURASIP Conference Focused on Speech and Image Processing, Multimedia Communications and Services EC-SIPMCS 2007, Maribor, Slovenia, June 2007.
- [C6] Evlambios E. Apostolidis, Alper Koz and George Triantafyllidis, "Watermarking tests for free-view point television", 1st International Conference on 3DTV, 3DTV CON 2007, Kos Island, Greece, May 2007.
- [C7] Alper Koz, Cevahir ıęla and A. Aydın Alatan, “Free-View Watermarking for Free-View Television”, in Proc. of IEEE International Conference on Image Processing (ICIP), pp. 1405-1408, October 2006.
- [C8] Alper Koz and A. Aydın Alatan, “Oblivious Video Watermarking Using Temporal Sensitivity of HVS”, in Proc. of IEEE International Conference on Image Processing (ICIP), vol. 1, pp. 961-4, September 2005.
- [C9] Alper Koz and A. Aydın Alatan, “Temporal Watermarking of Digital Video”, in Proc. of 4th European Workshop on Image Analysis for Multimedia Interactive Services (WIAMIS), pp. 271-274, April 2003.
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THESIS CO-SUPERVISION

- Furkan Gültekin, “Object Height Estimation on Monoscopic Satellite Images using Deep Learning”, *Master Thesis*, Geodetic and Geographic Information Technologies, Middle East Technical University, Ankara, January 2024.
Thesis Supervisor: Prof. Dr. Lütfi Süzen **Thesis Co-supervisor:** Assoc. Prof. Alper Koz
- Metehan Yalçın, “Target Detection in Hyperspectral Thermal Images”, *Master Thesis*, Electrical and Electronics Engineering Department, Hacettepe University, Ankara, May 2023.
Thesis Supervisor: Assoc. Prof. Seniha Esen Yüksel, **Thesis Co-supervisor:** Assoc. Prof. Alper Koz
- Okan Ozdemir, “Optimization and Deep Learning based Multi Modal Abundance Estimation and Unmixing Methods for Hyperspectral Images”, *Ph.D. Thesis*, Informatics Institute, Middle East Technical University, Ankara, December 2020.
Thesis Supervisor: Prof. Dr. Yasemin Yardımcı Çetin, **Thesis Co-supervisor:** Dr. Alper Koz
- Hilal Soydan, “Environmental Applications of Hyperspectral Anomaly and Target Detection Algorithms”, *Ph.D Thesis*, Mine Engineering Department, Middle East Technical University, Ankara, December 2017.
Thesis Supervisor: Prof. Dr. H. Celal Karpuz, **Thesis Co-supervisor:** Dr. Alper Koz
- Begüm Sözer, “Visibility of DCT Quantization Noise for High Dynamic Range Images”, *Master Thesis*, Computer Engineering Department, Middle East Technical University, Ankara, December 2019.
Thesis Supervisor: Assoc. Prof. A. Oğuz Akyüz, **Thesis Co-supervisor:** Dr. Alper Koz
- İlke Belenoğlu, “Target Detection on Short and Long Wavelength Hyperspectral Images”, *Master Thesis*, Electrical and Electronics Engineering Department, Hacettepe University, Ankara, September 2019.
Thesis Supervisor: Assoc. Prof. Seniha Esen Yüksel, **Thesis Co-supervisor:** Dr. Alper Koz
- Mustafa Kütük, “Superpixel-based Target Detection Methods for Hyperspectral Images”, *Master Thesis*, Electrical and Electronics Engineering Department, Middle East Technical University, Ankara, September 2018.
Thesis Supervisor: Prof. Dr. A. Aydın Alatan, **Thesis Co-supervisor:** Dr. Alper Koz
- Kutun Feyiz, “Directional Coding of Backward Compatible High Dynamic Range (HDR) Image Coding Residues”, *Master Thesis*, Electrical and Electronics Engineering Department, Middle East Technical University, Ankara, January 2018.
Thesis Supervisor: Assoc. Prof. Fatih Kamışlı, **Thesis Co-supervisor:** Dr. Alper Koz
- Doğa Çağdaş Demirkan, “Hierarchical Land Use and Land Cover Classification of Sentinel-2A Images and Its Use for Corine System”, *Master Thesis*, Geodetic and

Geographic Information Technologies, Middle East Technical University, Ankara, December 2017.

Thesis Supervisor: Prof. Dr. Zuhal Akyurek, **Thesis Co-supervisor:** Dr. Alper Koz

Daily Supervisions during Post-Doctoral Studies

- Mahmoud el Akkoui, “Scale Invariant Watermarking for Images”, *Master Thesis, Laboratory Signals and Systems, SUPELEC*, Paris, France, April 2011-July 2011. Thesis Supervisor: Assoc. Prof. Claude Delpha, Daily Supervisor: Dr. Alper Koz.
- Elie Matta, “QIM Watermarking for Compressed Audio Signals”, *Master Thesis, Laboratory Signals and Systems, SUPELEC*, Paris, France, June 2010. Thesis Supervisors: Assoc. Prof. Claude Delpha, Daily Supervisor: Dr. Alper Koz.
- Muhammad AlBaqir, “Video fingerprinting in compressed domain: Fingerprint method based on Motion Vectors”, *Master Thesis, Department of Mediamatics, Delft University of Technology*, June 2009. Thesis Supervisor: Prof. dr. ir. R.L. Lagendijk, Daily Supervisor: Dr. Alper Koz.

Supervised Undergraduate Students under the STAR¹ program of METU EEE

- Mustafa Öztürk, “Comparison of Basic Hyperspectral Unmixing Algorithms”, Undergraduate STAR Program (June 2016-June 2017), Electrical and Electronics Engineering, Middle East Technical University, Ankara.
Supervisors: Alper Koz and A. Aydın Alatan
- Bahar Taşkesen, “Unsupervised Change Detection in Satellite Images using Oversegmentation and Mutual Information”, Undergraduate STAR Program (June 2016-June 2017), Electrical and Electronics Engineering, Middle East Technical University, Ankara.
Supervisors: Beril Beşbınar, Alper Koz and A. Aydın Alatan

EDITORSHIP

- Associate Editor for Elsevier Signal Processing: Image Communication, September 2016-Current.
(<https://www.journals.elsevier.com/signal-processing-image-communication/editorial-board>)

REVIEWING ACTIVITIES

- Invited Editorship for TUBITAK Turkish Journal of Electrical Engineering and Computer Science.
- Reviewer for the following journals:
 - Elsevier Signal Processing: Image Communication
 - IEEE Transactions on Image Processing
 - IEEE Transactions on Circuits and Systems for Video Technology

¹ Undergraduate Student Academic Research (STAR) Program is a one-year research program that provides the undergraduate students of Electrical and Electronics Engineering (EEE) Department of METU with the opportunity to be part of various research groups in the department.

- IEEE Transactions on Information Forensics and Security
 - IEEE Transactions on Multimedia
 - Springer Signal, Image and Video Processing
 - Tübitak Turkish Journal of Electrical Engineering and Computer Science.
- Referee for the following research awards:
 - Serhat Özyar Young Scientist Award of the Year
 - METU Prof. Dr. Mustafa N. Parlar Education and Research Foundation Research Incentive Award

ORGANIZED WORKSHOP AND SPECIAL SESSION

- Programme Committee Member, NATO SET-277 Inter-Panel / Inter-Group Workshop on Phenomenology and Exploitation of Hyperspectral Sensing within NATO, 14-15 October 2019, Brussels, Belgium.
- Special Session on Hyperspectral Image Analysis in 23rd Signal Processing and Communications Applications Workshop, 16-19 May 2015, Malatya, Türkiye (National Conference). Organizers of Special Session: Dr. Alper Koz, Prof. A. Aydın Alatan.

NOTEWORTHY ACHIEVEMENTS AND AWARDS

- Ranked 1st as an instructor in fall 2015-2016 at EEE department of METU with respect to student course evaluation.
- Best project award, as a group of 5 students among about 50 groups in Senior Design Project Course in year 2000, given by the President of METU.
- Ranked in 0.1% in the national university entrance examinations in 1996.
- Ranked in 0.1% in the national science high school entrance examination in 1993.

REFERENCES

- References are available upon request.