

## Assoc. Prof. SİNAN KALKAN

### Personal Information

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### Education Information

Doctorate, Georg-August-Universitaet Göttingen, Matematik Fakültesi, Germany 2005 - 2008

Post Graduate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Bilgisayar Mühendisliği (YI) (Tezli), Turkey 2001 - 2003

Under Graduate, Middle East Technical University, Faculty of Engineering, Department of Environmental Engineering, Turkey 1996 - 2001

### Foreign Languages

English, C1 Advanced

### Dissertations

Doctorate, Multi-modal statistics of local image structures and its applications for depth prediction, Georg-August-Universitaet Göttingen, Matematik Fakültesi, 2008

Post Graduate, A comparative study of evolutionary network design, Middle East Technical University, Graduate School of Natural and Applied Sciences, Bilgisayar Mühendisliği (YI) (Tezli), 2003

### Research Areas

Computer Sciences, Artificial Intelligence, Computer Learning and Pattern Recognition, Engineering and Technology

### Academic Titles / Tasks

Associate Professor, Middle East Technical University, Faculty of Engineering, Bilgisayar Mühendisliği, 2017 - Continues

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Computer Engineering, 2010 - 2017

Research Assistant, Georg-August-Universitaet Göttingen, 2005 - 2008

Research Assistant, Middle East Technical University, Faculty of Engineering, Department of Computer Engineering, 2001 - 2003

### Professional Experience

Fakülte Yönetim Kurulu Üyesi, Middle East Technical University, Toplum Ve Bilim Merkezi, 2015 - Continues

Deputy Head of Department, Middle East Technical University, Faculty of Engineering, Department of Environmental Engineering, 2014 - 2017

## Advising Theses

- KALKAN S., Contextualized scene modeling using Boltzmann machines, Post Graduate, İ.BOZCAN(Student), 2018
- KALKAN S., End-to-end networks for detection and tracking of micro unmanned aerial vehicles, Post Graduate, C.AKER(Student), 2018
- KALKAN S., SAHİLLİOĞLU Y., Deep 3D semantic scene extrapolation, Post Graduate, A.ABBASI(Student), 2018
- KALKAN S., Hierarchical incremental context modeling on robots, Post Graduate, F.IRMAK(Student), 2017
- KALKAN S., TEMİZEL A., Spatial 3D local descriptors for object recognition in RGB-D images, Doctorate, K.BERKER(Student), 2016
- KALKAN S., A comparison of methods for trademark retrieval in a large trademark dataset, Post Graduate, W.TUERXUN(Student), 2015
- KALKAN S., ŞAHİN E., A grounded and contextualized web of concepts on a humanoid robot, Doctorate, H.ÇELİKKANAT(Student), 2015
- KALKAN S., Analysis of methods for border ownership estimation, Post Graduate, S.OLGUNSOYLU(Student), 2015
- KALKAN S., A multinomial prototype-based learning algorithm, Post Graduate, A.CAN(Student), 2014
- KALKAN S., Multi-modal stereo-vision using infrared/visible camera pairs, Doctorate, M.YAMAN(Student), 2014
- KALKAN S., Analysis of border ownership cues and improvement of depth prediction using border ownership, Post Graduate, M.AKİF(Student), 2014
- KALKAN S., A method for isolated sign recognition with Kinect, Post Graduate, E.İŞIKLIGİL(Student), 2014
- KALKAN S., Building a web of concepts on a humanoid robot, Post Graduate, G.ORHAN(Student), 2014
- YARMAN VURAL F. T. , KALKAN S., Estimating border ownership using iterative vector voting and conditional random fields, Post Graduate, B.ÖZKAN(Student), 2014
- KALKAN S., Analysis of methods for finger vein recognition, Post Graduate, F.YOUSEFİ(Student), 2013
- KALKAN S., ŞAHİN E., Formation of adjective, noun and verb concepts through affordances, Post Graduate, O.YÜRÜTEN(Student), 2012
- KALKAN S., Shape descriptors based on intersection consistency and global binary patterns, Post Graduate, E.SİVRİ(Student), 2012
- KALKAN S., Improving edge detection using intersection consistency, Post Graduate, S.ÇİFTÇİ(Student), 2011
- KALKAN S., ŞAHİN E., Emergence of verb and object concepts through learning affordances, Post Graduate, N.DAĞ(Student), 2010
- KALKAN S., ŞAHİN E., Function and appearance-based emergence of object concepts through affordances, Post Graduate, İ.ATIL(Student), 2010

## Jury Memberships

Doctorate, Doctorate, Odense Universitet (Odense University), January, 2018

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

- **Image-based construction of building energy models using computer vision**  
GÜRSEL DİNO İ., Sari A. E. , Iseri O. K. , Akin S., Kalfaoglu E., Erdogan B., KALKAN S., ALATAN A. A.  
AUTOMATION IN CONSTRUCTION, vol.116, 2020 (Journal Indexed in SCI)
- **COSMO: Contextualized scene modeling with Boltzmann Machines**  
Bozcan I., Kalkan S.  
ROBOTICS AND AUTONOMOUS SYSTEMS, vol.113, pp.132-148, 2019 (Journal Indexed in SCI)
- **Deep 3D semantic scene extrapolation**  
Abbasi A., Kalkan S., Sahillioğlu Y.  
VISUAL COMPUTER, vol.35, pp.271-279, 2019 (Journal Indexed in SCI)
- **MAGiC: A Multimodal Framework for Analysing Gaze in Dyadic Communication**  
Aydin U. A. , Kalkan S., Acartürk C.  
JOURNAL OF EYE MOVEMENT RESEARCH, vol.11, 2018 (Journal Indexed in SCI)
- **Performance evaluation of similarity measures for dense multimodal stereovision**

Yaman M., Kalkan S.

JOURNAL OF ELECTRONIC IMAGING, vol.25, 2016 (Journal Indexed in SCI)

- **Learning Context on a Humanoid Robot using Incremental Latent Dirichlet Allocation**

Çelikkanat H., Orhan G., Pugeault N., Guerin F., Sahin E., Kalkan S.

IEEE TRANSACTIONS ON COGNITIVE AND DEVELOPMENTAL SYSTEMS, vol.8, pp.42-59, 2016 (Journal Indexed in SCI)

- **CoSPAIR: Colored Histograms of Spatial Concentric Surflet-Pairs for 3D object recognition**

Logoglu K. B. , Kalkan S., TEMİZEL A.

ROBOTICS AND AUTONOMOUS SYSTEMS, vol.75, pp.558-570, 2016 (Journal Indexed in SCI)

- **Vision-Based Detection and Distance Estimation of Micro Unmanned Aerial Vehicles**

Gökçe F., Ucoluk G., Sahin E., Kalkan S.

SENSORS, vol.15, pp.23805-23846, 2015 (Journal Indexed in SCI)

- **A Probabilistic Concept Web on a Humanoid Robot**

Çelikkanat H., Orhan G., Kalkan S.

IEEE TRANSACTIONS ON AUTONOMOUS MENTAL DEVELOPMENT, vol.7, pp.92-106, 2015 (Journal Indexed in SCI)

- **An iterative adaptive multi-modal stereo-vision method using mutual information**

Yaman M., Kalkan S.

JOURNAL OF VISUAL COMMUNICATION AND IMAGE REPRESENTATION, vol.26, pp.115-131, 2015 (Journal Indexed in SCI)

- **Verb concepts from affordances**

Kalkan S., Dağ N., Yuerueten O., Borghi A. M. , Sahin E.

INTERACTION STUDIES, vol.15, pp.1-37, 2014 (Journal Indexed in SSCI)

- **The learning of adjectives and nouns from affordance and appearance features**

Yuerueten O., Şahin E., Kalkan S.

ADAPTIVE BEHAVIOR, vol.21, pp.437-451, 2013 (Journal Indexed in SCI)

- **Deep Hierarchies in the Primate Visual Cortex: What Can We Learn for Computer Vision?**

KRÜGER N., JANSSEN P., KALKAN S., LAPPE M., LEONARDİS A., PIATER J., Rodriguez-Sanchez A. J. , WISKOTT L.

IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, vol.35, pp.1847-1871, 2013 (Journal Indexed in SCI)

- **Disparity disambiguation by fusion of signal- and symbolic-level information**

Ralli J., Diaz J., KALKAN S., Krueger N., Ros E.

MACHINE VISION AND APPLICATIONS, vol.23, pp.65-77, 2012 (Journal Indexed in SCI)

- **Using multi-modal 3D contours and their relations for vision and robotics**

BAŞESKİ E., Pugeault N., Kalkan S., BODENHAGEN L., Piater J. H. , KRÜGER N.

JOURNAL OF VISUAL COMMUNICATION AND IMAGE REPRESENTATION, vol.21, pp.850-864, 2010 (Journal Indexed in SCI)

- **Continuous dimensionality characterization of image structures**

Felsberg M., Kalkan S., Kruger N.

IMAGE AND VISION COMPUTING, vol.27, pp.628-636, 2009 (Journal Indexed in SCI)

- **BIRTH OF THE OBJECT: DETECTION OF OBJECTNESS AND EXTRACTION OF OBJECT SHAPE THROUGH OBJECT-ACTION COMPLEXES**

KRAFT D., Pugeault N., BAŞESKİ E., POPOVIC M., Kragic D., Kalkan S., Woergoetter F., Krueger N.

INTERNATIONAL JOURNAL OF HUMANOID ROBOTICS, vol.5, pp.247-265, 2008 (Journal Indexed in SCI)

- **First-order and second-order statistical analysis of 3d and 2d image structure**

Kalkan S., Worgotter F., Kruger N.

NETWORK-COMPUTATION IN NEURAL SYSTEMS, vol.18, pp.129-160, 2007 (Journal Indexed in SCI)

- **Local image structures and optic flow estimation**

Kalan S., Calow D., Worgotter F., Lappe M., Kruger N.

NETWORK-COMPUTATION IN NEURAL SYSTEMS, vol.16, pp.341-356, 2005 (Journal Indexed in SCI)

## Articles Published in Other Journals

- **A Large-scale Dataset and Benchmark for Similar Trademark Retrieval**  
Tursun O., Aker C., Kalkan S.  
Arxiv, vol.1, no.1, 2018 (Non-Refreed Journal)
- **Towards an Embodied Developing Vision System**  
Atil I., Kalkan S.  
KUNSTLICHE INTELLIGENZ, vol.29, pp.41-50, 2015 (Journal Indexed in ESCI)

## Book & Book Chapters

- **Derin Öğrenme**  
Yarman Vural F. T. , Cinbiş R. G. , Kalkan S.  
Buzdağı Yayınevi, Ankara, 2018
- **Introduction to programming concepts with case studies in Python**  
ÜÇOLUK G., KALKAN S.  
Springer, 2012

## Refereed Congress / Symposium Publications in Proceedings

- **Vision-Based Lighting State Detection and Curtain Openness Ratio Prediction**  
Kalfaoğlu E., Gürsel Dino I., Işeri O. K. , Akın Ş., Sarı A. E. , Erdoğan B., Kalkan S., Alatan A. A.  
The Symposium on Simulation for Architecture and Urban Design (SimAUD), Vienna, Austria, 23 - 25 May 2020
- **Video Content Analysis-Based Detection of Occupant Presence for Building Energy Modelling**  
Gürsel Dino I., Kalfaoğlu E., Sarı A. E. , Akın Ş., Işeri O. K. , Alatan A. A. , Kalkan S., Erdoğan B.  
CIB W78: Conference: Advances in ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO), Newcastle-Upon-Tyne, United Kingdom, 18 - 20 September 2019
- **Automated building energy modeling for existing buildings using computer vision**  
Gürsel Dino I., Sarı A. E. , Kalfaoğlu E., Akın Ş., Işeri O. K. , Kalkan S., Alatan A. A. , Erdoğan B.  
CIB W78: Conference: Advances in ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO), Newcastle-Upon-Tyne, United Kingdom, 18 - 20 September 2019
- **Learning to Increment A Contextual Model**  
Kalkan S., Hande Ç., Doğan F. I. , Bozcan İ.  
Continual Learning Workshop at Neural Information Processing Systems, Montreal, Canada, 6 - 07 December 2018, pp.1-4
- **CINet: A Learning Based Approach to Incremental Context Modeling in Robots**  
Doğan F. I. , Bozcan I., Çelik M., Kalkan S.  
International Conference on Intelligent Robots (IROS 2018), Madrid, Spain, 1 - 05 October 2018
- **Localization recall precision (LRP): A new performance metric for object detection**  
Öksüz K., Çam B. C. , Akbaş E., Kalkan S.  
15th European Conference on Computer Vision, ECCV 2018, Munich, Germany, 8 - 14 September 2018, pp.521-537
- **A Deep Incremental Boltzmann Machine for Modeling Context in Robots**  
Doğan F. I. , Çelikkat H., Kalkan S.  
2018 IEEE International Conference on Robotics and Automation (ICRA), Brisbane, Australia, 21 - 25 May 2018
- **What is (Missing or Wrong) in the Scene? A Hybrid Deep Boltzmann Machine for Contextualized Scene Modeling**  
Bozcan I., Oymak Y., Alemdar İ. Z. , Kalkan S.  
2018 IEEE International Conference on Robotics and Automation (ICRA), Brisbane, Australia, 21 - 25 May 2018
- **Dynamic gaze analysis: An application environment for face-to-face communication**  
Ülkü A. A. , Kalkan S., Acartürk C.  
2017 International Artificial Intelligence and Data Processing Symposium (IDAP), Malatya, Turkey, 16 - 17

September 2017

- **Using deep networks for drone detection**

Aker C., Kalkan S.

14th IEEE International Conference on Advanced Video and Signal Based Surveillance, AVSS 2017, Lecce, Italy, 29 August - 01 September 2017

- **Drone-vs-Bird detection challenge at IEEE AVSS2017**

Coluccia A., Ghenescu M., Piatrik T., De Cubber G., Schumann A., Sommer L., Klatte J., Schuchert T., Beyerer J., Farhadi M., et al.

14th IEEE International Conference on Advanced Video and Signal Based Surveillance, AVSS 2017, Lecce, Italy, 29 August - 01 September 2017

- **A gaze-centered multimodal approach to human-human social interaction**

Acartürk C., Kalkan S., Aydin U. A.

3rd IEEE International Conference on Cybernetics, CYBCONF 2017, Exeter, United Kingdom, 21 - 23 June 2017

- **Analyzing deep features for trademark retrieval Marka Erişimi İçin Derin Özniteliklerin İncelenmesi**

Aker C., Tursun O., Kalkan S.

25th Signal Processing and Communications Applications Conference, SIU 2017, Antalya, Turkey, 15 - 18 May 2017

- **SHREC'16 track: Shape retrieval of low-cost RGB-D captures**

Pascoal P. B. , Proença P., Gaspar F., Dias M. S. , Ferreira A., Tatzuma A., Aono M., Logoglu K. B. , Kalkan S., Temizel A., et al.

9th Eurographics Workshop on 3D Object Retrieval, 3DOR 2016, Lisbon, Portugal, 08 May 2016, pp.69-78

- **Mikro İnsansız Hava Araçlarının Kademeli Sınıflandırıcılarla Algılanması ve Mesafe Tespiti**

Gökçe F., Üçoluk G., Şahin E., Kalkan S.

Türkiye Robotbilim Konferansı, İstanbul, Turkey, 26 - 27 October 2015

- **Integrating Spatial Concepts into a Probabilistic Concept Web**

Celikkanat H., Sahin E., Kalkan S.

International Conference on Advanced Robotics (ICAR), İstanbul, Turkey, 27 - 31 July 2015, pp.259-264

- **METU Dataset: A Big Dataset for Benchmarking Trademark Retrieval**

Tursun O., Kalkan S.

14th IAPR International Conference on Machine Vision Applications (MVA), Tokyo, Japan, 18 - 22 May 2015, pp.514-517

- **An MRF Framework For Co-Solving Image Segmentation and Border Ownership**

Karadag O. O. , Akkus M. A. , Kalkan S., Vural F. T. Y.

23rd Signal Processing and Communications Applications Conference (SIU), Malatya, Turkey, 16 - 19 May 2015, pp.839-842

- **Learning and Using Context on a Humanoid Robot Using Latent Dirichlet Allocation**

Celikkanat H., Orhan G., Pugeault N., Guerin F., Şahin E., Kalkan S.

4th Joint IEEE International Conferences on Development and Learning and Epigenetic Robotics (IEEE ICDL-Epirob), Genoa, Italy, 13 - 16 October 2014, pp.201-207

- **Using Slowness Principle for Feature Selection: Relevant Feature Analysis**

Celikkanat H., KALKAN S.

22nd IEEE Signal Processing and Communications Applications Conference (SIU), Trabzon, Turkey, 23 - 25 April 2014, pp.1540-1543

- **Analysis of Widely-used Descriptors for Finger-vein Recognition**

Yousefi F., Sivri E., KAYA Ö., Suloglu S., KALKAN S.

9th International Conference on Computer Vision Theory and Applications (VISAPP), Lisbon, Portugal, 5 - 08 January 2014, pp.564-571

- **Recurrent Slow Feature Analysis for Developing Object Permanence in Robots**

ÇELİKKANAT H., ŞAHİN E., KALKAN S.

IROS Workshop on Neuroscience and Robotics, 03 November 2013

- **Co-learning nouns and adjectives**

Orhan G., Olgunsoylu S., Şahin E., Kalkan S.

2013 IEEE 3rd Joint International Conference on Development and Learning and Epigenetic Robotics, ICDL 2013,

Osaka, Japan, 18 - 22 August 2013

- **Global Binary Patterns A Novel Shape Descriptor**

Erdal S., Kalkan S.

Int. IAPR Conference on Machine Vision and Applications, Kyoto, Japan, 20 - 23 May 2013, vol.1

- **Multimodal Stereo Vision Using Mutual Information with Adaptive Windowing**

Yaman M., Kalkan S.

Int. IAPR Conference on Machine Vision and Applications, Kyoto, Japan, 20 - 23 May 2013, vol.1

- **Extraction of border ownership information by conditional random field model Koşullu rastgele alan modeli ile sınır sahipliği bilgisi çıkarımı**

Özkan B., Kalkan S.

2013 21st Signal Processing and Communications Applications Conference, SIU 2013, Haspolat, Turkey, 24 - 26 April 2013

- **A novel shape descriptor: Intersection consistency histograms Yeni bir şekil betimleyici: Kesişimlerin tutarlılığı histogram**

Sivri E., Kalkan S.

2013 21st Signal Processing and Communications Applications Conference, SIU 2013, Haspolat, Turkey, 24 - 26 April 2013

- **Relating affordances with verbs, nouns and adjectives Sağlarlık ile fiiller, isimler ve sıfatların ilişkilendirilmesi**

Kalkan S., Yürüten O., Şahin E.

2013 21st Signal Processing and Communications Applications Conference, SIU 2013, Haspolat, Turkey, 24 - 26 April 2013

- **A comprehensive database for border ownership Sınır Sahipliği İçin Kapsamlı Bir Veri Tabanı**

Akkuş M. A. , Topuz G., Özkan B., Kalkan S.

2013 21st Signal Processing and Communications Applications Conference, SIU 2013, Haspolat, Turkey, 24 - 26 April 2013

- **Human and robotics hands grasping danger**

ANELLI F., NICOLETTI R., KALKAN S., ŞAHİN E., BORGHI A. M.

International Joint Conference on Neural Networks (IJCNN), Brisbane, Australia, 10 - 15 June 2012

- **Learning affordances for categorizing objects and their properties**

Dağ N., Atil I., KALKAN S., ŞAHİN E.

2010 20th International Conference on Pattern Recognition, ICPR 2010, İstanbul, Turkey, 23 - 26 August 2010, pp.3089-3092

## Supported Projects

Akbaş E., Kalkan S., TUBİTAK Project, Object Detection in Videos with Deep Neural Networks, 2018 - 2021

Gürsel Dino I., Kalkan S., Alatan A. A. , TÜBİTAK International Bilateral Joint Cooperation Program Project, SISER: A Stakeholder-Oriented Intelligent System for Building Energy Retrofitting, 2018 - 2020

Kalkan S., Acartürk C., TUBİTAK Project, Multiuser Eyetracking Platform for Social Gaze, 2017 - 2020

KALKAN S., UĞURLU H. İ. , SARANLI A., Project Supported by Higher Education Institutions, İnsansız Hava ve Kara Araçları ile Gezinme, 2018 - 2019

Kalkan S., Sahillioğlu Y., TUBİTAK Project, 3D Scene Segmentation and Synthesis, 2016 - 2019

KALKAN S., AKBAŞ E., Project Supported by Other Private Institutions, İNSANSIZ HAVA ARAÇLARINDA TEK VE ÇİFT KAMERA İLE İNİŞ NOKTASINA BAĞIL KONUM KESTİRİMİ, 2018 - 2018

Kalkan S., TUBİTAK Project, Robotlarda Bağlam, 2016 - 2018

KALKAN S., Industrial Thesis Project, Büyük Veritabanında Benzer Marka Logolarını Sıralama, 2013 - 2016

KALKAN S., TUBİTAK Project, Acquiring Accurate Visual Information from Images Using Border Ownership, 2014 - 2015

KALKAN S., TUBİTAK Project, Development of Hierarchical Concepts in Humanoid Robots, 2012 - 2015

KALKAN S., Project Supported by Higher Education Institutions, Çoklu robot ve insan etkilesimi, 2012 - 2013

## Scientific Refereeing

IEEE ROBOTICS AND AUTOMATION LETTERS, Other Indexed Journal, October 2018  
IEEE-ASME TRANSACTIONS ON MECHATRONICS, SCI Journal, September 2018  
Adaptive Behavior, Journal Indexed in SSCI, March 2018  
Teknokent Proje Hakemliđi, Other Journals, March 2018  
Uni. Southern Denmark - Doktora Tez Jürisi Üyeliđi, Other journals, January 2018  
TUBITAK Project, July 2016

## Scientific Consultations

Nurd Comodo, Scientific Consultancy, Orta Dođu Teknik Üniversitesi, Mühendislik Fakültesi, Bilgisayar Mühendisliđi, Turkey, 2019 - Continues

## Invited Congress and Symposium Activities

Neural Information Processing Systems, Attendee, Canada, 2018  
IROS 2018 - International Conference on Intelligent Robots, Attendee, Spain, 2018  
15th European Conference on Computer Vision, Attendee, Germany, 2018  
IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION (ICRA), Attendee, Australia, 2018

## Citations

Total Citations (WOS):368  
h-index (WOS):10

## Invited Talks

Context in robots, Workshop, Orta Dođu Teknik Üniversitesi, Turkey, December 2018  
Derin Öğrenmeye Giriş , Seminar, Gazi Üniversitesi, Turkey, December 2018  
Context in robots, Workshop, IROS2018 Workshop on Semantic Policy and Action Representations for Autonomous Robots (SPAR), Spain, October 2018  
Context in robots, Seminar, Tobb Ekonomi Ve Teknoloji Üniversitesi, Turkey, February 2018  
Context in robots, Seminar, Odense Universitet (Odense University), Denmark, January 2018  
Derin öğrenmeye giriş, Seminar, Simsoft Bilgi Teknolojileri, Turkey, January 2018

## Awards

KALKAN S., Yılın Tezi Ödülü, Prof. Dr. Mustafa Parlar Vakfi, December 2018  
Kalkan S., Instructor of the year, Prof. Dr. Mustafa Parlar Vakfi, December 2014