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 Hacettepe University
 Department of Artificial Intelligence
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EDUCATION

Bogazici University, Istanbul, Turkey

Ph.D. in Electric & Electronic Engineering
 2006 - 2013

Thesis: Scene Exploration and Recognition with an Attentive Robot
 Advisor: Prof. Dr. Isil Bozma

Middle East Technical University, Ankara, Turkey

M.Sc. in Cognitive Science
 2001 - 2004

Thesis: An Eye Movement Analysis Of Chess Players Across Levels Of Expertise: An Electrooculography Study
 Advisor: Assist. Prof. Dr. Suha Yagcioglu

Middle East Technical University, Ankara, Turkey

B.Sc. in Mechanical Engineering
 1997 - 2001

WORK EXPERIENCE RELATED TO ACADEMIA

Hacettepe University, Ankara, Turkey

Department of Artificial Intelligence
 2021-Current Asst. Professor

INRIA/Toyota, Grenoble – Rhône-Alpes, France

Senior Researcher at Team Chroma
 2017-2019 PostDoc
 2019-2021 Starting Research Position.

University of Innsbruck, Austria

Senior Researcher at Intelligence and Interactive Systems
 2013-2017

Bogazici University, Istanbul, Turkey

Research Assistant at Electric & Electronic Engineering
 2006 – 2013

SUPERVISED THESIS

Master Thesis: Manuel Alejandro Diaz-Zapata, 2020, "YOLO-Based Panoptic Segmentation", Master of Science in Informatics at Grenoble Master Informatique Specialization Graphics, Vision and Robotics, Universite Grenoble Alpes

CO-SUPERVISED THESIS

Master Thesis: Vladislav Shlenskii, 2020, "Domain adaptation for cross-sensor 3D object detection on point-clouds", Master's Educational Program: Industrial and Applied Mathematics, Universite Grenoble Alpes

RESEARCH INTERESTS

Scene recognition and exploration, autonomous vehicles, semantic segmentation, pose estimation, place recognition, scene classification, mobile robots, biologically motivated vision, object recognition, 3D vision, eye movements, active vision systems, mechanical design of robots.

PROJECTS

- European Commission Horizon 2020 Marie Skłodowska-Curie Actions Cofund program, (CoCirculation2, TUBITAK 2236), (2021-?), A Generalized Adaptive Multi-Task Perception System for Mobile Platforms, Principal Investigator. (Total Budget: ~110.000 Euros)
- BAP (Scientific Research Projects), "FKB-2022-20194", Anomaly Detection in Autonomous Mobile Vehicles 2022-2024, Principal Investigator (Total Budget: ~5500 Euros)
- BAP (Scientific Research Projects), "FAY-2022-20118", Derin öğrenme ile yapay zeka ve robotik tabanlı otonom sistem uygulamalarının geliştirilmesi 2022-2023, Research (Total Budget: ~110.000 Euros)
- Joint Project on Perception of Autonomous Vehicles (Inria/Toyota Collaboration), Varying Topics (2017-2021), Researcher.
- EU Project (European Union), 3rd Hand Robot, (2013-2017), Researcher.
- TÜBİTAK (Turkish Scientific and Technological Research Foundation), " 111E285", Hybrid Mapping and Scene Perception by Comparison Methodology for Multi-Robots, (2012-2013), Phd Student.
- BAP (Scientific Research Projects), "5720", Different Perception Types and Sharing via Communication for MultiRobot

Systems 2011-2012, Phd Student.

- BAP (Scientific Research Projects), "09HA210D", Scene Recognition with Multi-Robots, 2009-2010, Phd Student.

- TÜBİTAK "107M240", Scene Recognition, Navigation and Coordination on Mobile Robots based on Attention, (2007-2010), PhD Student.

PUBLICATIONS

JOURNALS

Ö. **Erkent** and C. Laugier, "Semantic Segmentation With Unsupervised Domain Adaptation Under Varying Weather Conditions for Autonomous Vehicles," in IEEE Robotics and Automation Letters, vol. 5, no. 2, pp. 3580-3587, April 2020.

Erkent, Ö., Wolf, C., & Laugier, C. (2019). End-to-End Learning of Semantic Grid Estimation Deep Neural Network with Occupancy Grids. Unmanned Systems, 07(03), 171–181.

Dadhichi Shukla, Ozgur **Erkent** and Justus H. Piater, "Learning Semantics of Gestural Instructions for Human-Robot Collaboration", NeuroRobotics, (2018): 1-15

Ö. **Erkent**, Karaoğuz, H., and H. I. Bozma, "Hierarchically self-organizing visual place memory", Advanced Robotics, (2017) 31-16 pp. 865-879

Karaoğuz, H., Ö. **Erkent**, and H. I. Bozma. "RGB-D based place representation in topological maps." Machine Vision and Applications 25.8 (2014): 1913-1927.

Erkent, Ö., H. I. Bozma, " Bubble Space and Place Representation in Topological Maps ", International Journal of Robotics Research, vol. 32, no. 6, pp. 671 – 688, 2013.

Erkent, Ö., H. I. Bozma, " Artificial potential functions based camera movements and visual behaviors in attentive robots", Autonomous Robots, DOI: 10.1007/s10514-011-9240-5 32, pp: 15-34, 2012.

CONFERENCES

Diaz-Zapata, M. A., González, D. S., **Erkent**, Ö., Dibangoye, J., & Laugier, C. (2023, May). LAPTNet-FPN: Multi-scale LiDAR-aided Projective Transform Network for Real Time Semantic Grid Prediction. In 2023 IEEE International Conference on Robotics and Automation (ICRA).

David Sierra González, Anshul Paigwar, Özgür **Erkent**, Christian Laugier. MultiLane: Lane Intention Prediction and Sensible Lane-Oriented Trajectory Forecasting on Centerline Graphs. ITSC 2022 - 25th IEEE International Conference on Intelligent Transportation Systems, Sep 2022, Macao, China. pp.1-8.

Salazar-Gomez, G., González, D. S., Diaz-Zapata, M. A., Paigwar, A., Liu, W., **Erkent**, Ö., & Laugier, C. (2022, December). TransFuseGrid: Transformer-based Lidar-RGB fusion for semantic grid prediction. In ICARCV 2022-17th International Conference on Control, Automation, Robotics and Vision.

Diaz-Zapata, M., **Erkent**, Ö., Laugier, C., Dibangoye, J., & Sierra-Gonzalez, D. (2022, December). LAPTNet: LiDAR-Aided Perspective Transform Network. In 2022 17th International Conference on Control, Automation, Robotics and Vision (ICARCV) (pp. 281-286). IEEE.

Erkent Ö., Gonzalez D.S., Paigwar A., Laugier C. (2021) GridTrack: Detection and Tracking of Multiple Objects in Dynamic Occupancy Grids. In: Vincze M., Patten T., Christensen H.I., Nalpantidis L., Liu M. (eds) Computer Vision Systems. ICVS 2021. Lecture Notes in Computer Science, vol 12899. Springer, Cham. https://doi.org/10.1007/978-3-030-87156-7_15

Anshul Paigwar, David Sierra-Gonzalez, Özgür **Erkent**, Christian Laugier. Frustum-PointPillars: A Multi-Stage Approach for 3D Object Detection using RGB Camera and LiDAR. International Conference on Computer Vision, ICCV, Workshop on Autonomous Vehicle Vision, Oct 2021, California, United States.

Manuel Diaz-Zapata, Özgür **Erkent** and Christian Laugier, "YOLO-based Panoptic Segmentation Network", Workshop: SE4ICPS @ COMPSAC 2021.

Zapata, Manuel Diaz, Özgür **Erkent**, and Christian Laugier. "Instance Segmentation with Unsupervised Adaptation to Different Domains for Autonomous Vehicles." ICARCV 2020-16th International Conference on Control, Automation, Robotics and Vision. 2020.

González, D. S., Paigwar, A., **Erkent**, Ö., Dibangoye, J., & Laugier, C. (2020, December). Leveraging Dynamic Occupancy Grids for 3D Object Detection in Point Clouds. In 16th IEEE International Conference on Control, Automation, Robotics and Vision (ICARCV).

Hernandez, A. E. G., **Erkent** O., and Laugier C.. "Recognize Moving Objects Around an Autonomous Vehicle Considering a Deep-learning Detector Model and Dynamic Bayesian Occupancy." 2020 16th International Conference on Control, Automation, Robotics and Vision (ICARCV). IEEE, 2020.

A. Paigwar, Ö. **Erkent**, D. Sierra-González, C. Laugier. GndNet: Fast Ground Plane Estimation and Point Cloud Segmentation for Autonomous Vehicles. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct 2020.

Ö. **Erkent** and C. Laugier, "Semantic Segmentation With Unsupervised Domain Adaptation Under Varying Weather Conditions for Autonomous Vehicles," in IEEE ICRA, 2020.

O. **Erkent**, C. Laugier (2019) Feature Generator Layer for Semantic Segmentation Under Different Weather Conditions for Autonomous Vehicles, 11th IROS Workshop on Planning, Perception, Navigation for Intelligent Vehicle.

Anshul Paigwar, Ozgur **Erkent**, Christian Wolf, Christian Laugier, Attentional PointNet for 3D-Object Detection in Point Clouds, 2019 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)

Ozgur **Erkent**, Christian Wolf, Christian Laugier, End-to-End Semantic Grid Estimation Deep Neural Network with Occupancy Grids, Apprentissage et Robotique Workshop (GDR ISIS + GDR Robotique), 2019

Özgür **Erkent**, Christian Wolf, Christian Laugier, Semantic Grid Estimation with Occupancy Grids and Semantic Segmentation Networks, ICARCV 2018.

Özgür **Erkent**, Christian Wolf, Christian Laugier , David Sierra Gonzalez, Victor Romero Cano. Semantic Grid Estimation with a Hybrid Bayesian and Deep Neural Network Approach, IEEE/RSJ International Conference on Robots and Systems (IROS), 2018

David Sierra González, Ozgur **Erkent**, Victor Romero-Cano, Christian Laugier, Jilles Dibangoye, Modeling Driver Behavior from Demonstrations in Dynamic Environments Using Spatiotemporal Lattices , IEEE/RSJ International Conference on Robotics and Automation, 2018.

Ozgur **Erkent**, Dadhichi Shukla, Justus Piater, Visual Task Outcome Verification Using Deep Learning, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2017.

Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, Proactive, Incremental Learning of Gesture-Action Associations For Human-Robot Collaboration. International Symposium on Robot and Human Interactive Communication, 2017

Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, Supervised learning of gesture-action associations for human-robot collaboration. 1st International Workshop on Adaptive Shot Learning for Gesture Understanding and Production, 2017 (Workshop at the 12th IEEE International Conference on Automatic Face and Gesture Recognition (FG 2017)

Lars Jensen, Kerstin Fischer, Franziska Kirstein, Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, It Gets Worse Before it Gets Better; Timing of Instructions in Close Human-Robot Collaboration. 12th ACM/IEEE International Conference on Human-Robot Interaction, 2017. Extended Abstract.

Ozgur **Erkent** , Dadhichi Shukla, Justus Piater, Integration of Probabilistic Pose Estimates From Multiple Views,, 2016, European Conference on Computer Vision

Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, A Multi-View Hand Gesture RGB-D Dataset for Human-Robot Interaction Scenarios, 2016, 25th International Symposium on Robot and Human Interactive Communication

Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, The IMHG dataset: A Multi-View Hand Gesture RGB-D Dataset for Human-Robot Interaction. Towards Standardized Experiments in Human Robot Interactions, 2015 (Workshop at IROS). Extended Abstract.

Dadhichi Shukla, Ozgur **Erkent**, Justus Piater, Probabilistic detection of pointing directions for human robot interaction. International Conference on Digital Image Computing: Techniques and Applications, 2015.

Kerstin Fischer, Lars Jensen, Franziska Kirstein, Sebastian Stabinger, Ozgur **Erkent**, Dadhichi Shukla, Justus Piater, Roles of Social Gaze in Human-Robot Collaborative Assembly Tasks. International Conference on Social Robotics, pp. 204-213, 2015.

Shukla, D., Ö. **Erkent**, J. Piater, "General Object Tip Detection and Pose Estimation for Robot Manipulation". 10th International Conference on Computer Vision Systems, pp. 364–374, 2015. Springer LNCS 9163.

Erkent, Ö., H.I. Bozma, "Long-term topological place learning," Robotics and Automation (ICRA), 2015 IEEE International Conference on , vol., no., pp.5462,5467, 26-30 May 2015.

Lopes, M., J. Peters, J. Piater, M. Toussaint, A. Baisero, B. Busch, Ö. **Erkent**, O. Kroemer, R. Lioutikov, G. Maeda, Y. Mollard, T. Munzer, D. Shukla, "Semi-Autonomous 3rd-Hand Robot. Robotics in future manufacturing scenarios", 2015 (Workshop at the European Robotics Forum, Vienna, Austria). Extended Abstract.

Kirstein, F., K. Fischer, Ö. **Erkent**, J. Piater, "Human Smile Distinguishes between Collaborative and Solitary Tasks in Human-Robot Interaction". 10th ACM/IEEE International Conference on Human-Robot Interaction, pp. 145–146, 2015. Extended Abstract.

Erkent, Ö., H.I. Bozma, "Integrating cue descriptors in bubble space for place recognition," in 9th International Conference on Computer Vision Systems, LNCS 7963, St. Petersburg, 2013, pp. 314–323.

Erkent, Ö., H.I. Bozma, "Place Representation in Topological Maps Based on Bubble Space", IEEE Int. Conf. on Robotics and Automation, USA, 2012 pp. 3497–3502.

Erkent, Ö., H. I. Bozma, "Unmanned Systems Endowed with Attention", International UNMANNED VEHICLES Workshop, Turkey, 2010.

Cayci S, **Erkent** O, Bozma H I, "Attentive mobile robot visual maps via bubble memory" Perception 38 ECVF Abstract Supplement, 47, 2009.

Erkent, Ö., H.I. Bozma, "Color Based Saccades for Attention Control", "10th European Conference on Computer Vision workshop: 'Vision in Action: Efficient strategies for cognitive agents in complex environments'", Marseilles, France, October 2008

Özgür **Erkent**, B. Deniz İlhan and H.İşıl Bozma, "Local and Global Saccades", Gordon Research Conference: Sensory Coding & the Natural Environment, Montana, USA, 2006.

İlhan, B.D., O. **Erkent** and H. I. Bozma. "Saccades and Fixating Using Artificial Potential Functions", Proceedings of IEEE/IRJ Conference on Intelligent Robots and Systems, pp: 5819-5824, 2006.

PATENTS

Erkent, O.; Othmezouri, G.; Laugier, C.; 2020, A method and System of Adapting an Initial Model of a Neural Network PCT-- patent application, filed 28.02.2020, 20305205.5 - 1207 Patent Pending.

Erkent, O.; Vignard, N.; Laugier, C.; Wolf, C., 2018, Semantic Occupancy Grid Segmentation 2023-06-20 Application granted, US11682129B2.

JOURNALS (TURKISH)

Erkent Ö., and Bozma I "Gezgin Robotlar İçin Görsel Temelli Yönelim Ve Ortam Açıklık Bilgilerinin Kestirimi", Sigma Mühendislik ve Fen Bilimleri Dergisi, 5 (1), pp:74-85, 2013.

Karaoguz H, **Erkent** Ö., and Bozma I "Topolojik Haritalarda 3B Uzaklık Ölçüm Bilgisine Dayali Yer Gösterimi", Sigma Mühendislik ve Fen Bilimleri Dergisi, 5 (1), pp:52-61, 2013.

Karaoguz H, **Erkent** Ö., Bayram H. and Bozma I " Tek Robottan Çoklu Robotlara Ortam Haritalama ", EMO Bilimsel Dergi, 4 (2), 2013.

CONFERENCES (TURKISH)

Erkent, Ö. and Bozma I. "Robotlar için Görsel Temelli Yönelim ve ortam Açıklık Bilgilerinin Kestirimi", ASYU 2012 (Innovations and Applications in Intelligent Systems Symposium),pp 75-79 Turkey, 2012

Karaoguz H, **Erkent** Ö. and Bozma I. "Topolojik Haritalarda 3B Uzaklık Ölçüm Bilgisine Dayali Yer Gösterimi", ASYU 2012 (Innovations and Applications in Intelligent Systems Symposium),pp 153-157 Turkey, 2012

Erkent, Ö., H. I. Bozma, "Attentive Vision, Scene Representation and Bubble Space", IEEE 18th Signal Processing and Communication Applications Conference, Turkey, 2010

Erkent, Ö., H. I. Bozma, "Color in Attention Control", IEEE 17th Signal Processing and Communication Applications Conference, Turkey, 2009

İlhan, B.D., O. **Erkent** and H. I. Bozma, "Yapay Gizilgüç İşlevleriyle Odaklanma Amaçlı Hızlı Hareketler", Automatic Control National Conference, Turkey, 2006

Ö. **Erkent**, S. Yagcioglu, "Satranç Oyuncularında Göz Hareketleri: Bir EOG Çalışması" (Eye Movements Among Chess Players: An EOG Study), 14th National Biophysics Conference, Ankara, Turkey, 2003.

INVITED TALKS

Bilgi University 2016: *Robot Vision for Action. Pose estimation of objects for manipulation tasks by using multiple views, appearance-based gesture recognition for basic robot interaction.*
Istanbul Technical University 2017: *Robot vision for various robot tasks including object manipulation, basic skill learning and scene recognition.*
Middle East Technical University 2017: *Deep learning in robotics. - Part of Deep Learning Hands on Lecture organized by METU Electrical and Electronics Engineering*
Koç University 2019: *Robot Perception for Action. Relation between different perception tasks in robotics, i. e. Semantic Grids, Task Verification.*
Bogazici University, 2019: *Fusion and Domain Adaptation for Perception in Autonomous Vehicles*

ATTENDED EVENTS

Co-Area Chair (3DV) at SIU 32th, Signal Processing and Communications Applications Conference, 2024
Co-Area Chair (3DV) at SIU 31th, Signal Processing and Communications Applications Conference, 2023
Co-Area Chair (3DV) at SIU 30th, Signal Processing and Communications Applications Conference, 2022
Guest Associate Editor at Frontiers in Robotics and AI Sensor Fusion and Machine Perception , 2020
Turkey Robotics Conference, Istanbul, 2019, Science Committee Member.
Turkey Robotics Conference, Istanbul, 2018, Science Committee Member.
Workshop on Computational Models of the Visual Cortex 2017: 10th EAI International Conference on Bio-Inspired Information and Communications Technologies, 2017, New Jersey, Technical Program Committee Member.
Workshop on Recovering 6D Object Pose, @ The 14th European Conference on Computer Vision – Amsterdam, 2016, Technical Program Committee Member.
Workshop on Computational Models of the Visual Cortex: Hierarchies, Layers, Sparsity, Saliency and Attention @ 9th EAI International Conference on Bio-Inspired Information and Communications Technologies, 2015, New York, Technical Program Committee Member.
2nd PLUS Advanced School on Computer Vision, Pattern Recognition, and Image Processing; March 21-24, 2011 – Genova, Italy

OTHER RELATED EXPERIENCE- TEACHING, INDUSTRIAL, ETC:

Supervised Projects:

“Algorithm Implementation on a Real Mobile Robot” by Kaan Tunçer, Yunus Emre Yazıcı, Tuana Çetinkaya 2023 submitted to Department of Computer Science, Hacettepe University, <https://github.com/kaantuncer/Moborobo-Project>, <https://tuanacetinkaya.github.io/Moborobot/>
“Learn To Race” by İlker Emre KOÇ, Selçuk YILMAZ, Buğrahan HALICI, İrem Atak 2023 submitted to Department of Computer Science, Hacettepe University, <https://github.com/bhalici/BBM480-Learn-to-Race-Project.git>, <https://learntorace.github.io/>
“Active Object Tracking via Simulation” by Batuhan Ayvaz, Bekir Semih Tekeli, Batuhan Orhon 2022 submitted to Department of Computer Science, Hacettepe University https://github.com/Batukhann/object_tracking_via_simulation
“Gaze Estimation in Video” by Mathias Mitterdorfer 2015 submitted to Department of Computer Science, Innsbruck University

Hacettepe University, Taught Courses

CMP 231 Logic Design (+Lab)
CMP 234 Computer Organization
AIN 451 Introduction to Robotics (+Lab)
AIN 455 Introduction to Human-Robot Interaction (+Lab)
CMP 755 Robotics

Bogazici University, Courses Assisted as TA

EE 573 Pattern Recognition
EE 576 Machine Vision
EE 101 Orientation to Electrical Engineering
EE 210 Introduction to Electrical Engineering
EE 242 Numerical Methods for Electrical Engineering
EE 304 Energy Conversion
EE 450 Control Technology & Design
EE 451 Introduction to Robot Control
EE 577 Statistical Signal Analysis

Military Service Completed, Turkey 2005

ASELSAN (Military Electronics Industry), Ankara, Turkey

Mechanical Design Engineer(Design of Communication Devices and Structures, Intranet management software) 2001 - 2005

Turkish Intelligence Foundation, Ankara, Turkey

Researcher (Article writing, creating mind puzzles, web design, etc. for www.tzv.org.tr) 2000 - 2001

SKILLS

Language - Fluent in English, intermediate in German and beginner in Russian and French

