

ERDEM YÖRÜK, PH.D.

January, 2021

CONTACT INFORMATION

ADDRESS Levent Mah. Krizantem Sok. No:28, 34330, Beşiktaş, İstanbul, Turkey
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CURRENT EMPLOYMENT

2021 - PRESENT CHIEF TECHNOLOGY OFFICER
Vispera Information Technologies
İstanbul, Turkey

2015 - PRESENT ADJUNCT FACULTY
Boğaziçi University, Department of Electrical-Electronics Engineering
İstanbul, Turkey

RESEARCH INTERESTS

COMPUTER VISION Scene Understanding, Object Recognition, Fine-Grained Classification, Action Recognition, 3D Pose Estimation from 2D

MACHINE LEARNING Deep CNNs, Generative Adversarial Networks, Few-Shot Learning, Embedding Learning, Bayesian Networks, Latent Variable Models

BIOINFORMATICS Biomolecular Network Inference, Protein Signaling Networks, Biomarker Discovery

EDUCATION

2005 - 2011 PH.D. IN APPLIED MATHEMATICS & STATISTICS
JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD, USA
Concentration in Computational Medicine with Mathematical Bioinformatics Track
DOCTORAL DISSERTATION TITLE: *Learning Graphical Models with Limited Observations of High-Dimensional Data*
ADVISOR: Donald Geman, Ph.D.

2002 - 2004 M.S. IN ELECTRICAL & ELECTRONICS ENGINEERING
BOĞAZIÇI UNIVERSITY, İSTANBUL, TURKEY
MASTER THESIS TITLE: *Hand Biometrics*
ADVISOR: Bülent Sankur, Ph.D.

1997 - 2002 B.S. IN ELECTRICAL & ELECTRONICS ENGINEERING
BOĞAZIÇI UNIVERSITY, İSTANBUL, TURKEY
SENIOR THESIS TITLE: *Symmetry Based Face Detection*
ADVISOR: Bülent Sankur, Ph.D.

PROFESSIONAL EXPERIENCE

- 2021 - PRESENT CHIEF TECHNOLOGY OFFICER
Vispera Information Technologies
İstanbul, Turkey
- Management of AI, Software and Product R&D: Supervision of technical product strategy and R&D resource planning; Management of AI, data analytics and system engineering R&D
 - Management of Technological Partnerships: Leading relationships with global HW solution partners and technology providers in joint product development, marketing and deployment
 - IP Management: Scientific publication and patent filing of company intellectual property
 - Principal Investigation: Preparation, conduct and administration of national and international research grants
- 2014 - 2020 CHIEF SCIENTIST
Vispera Information Technologies
İstanbul, Turkey
- Management of AI & Algorithmic R&D: Planning and executive supervision of R&D on core AI, computer vision, machine learning and data analytics
 - IP Management: Scientific publication and patent filing of company intellectual property
 - Principal Investigation: Preparation, conduct and administration of national and international research grants
 - Academic Advising: Thesis supervision of doctoral students in joint and related academic projects
- 2015 - PRESENT ADJUNCT FACULTY
Department of Electrical & Electronics Engineering
Boğaziçi University, İstanbul, Turkey
- Instructor for graduate level courses in statistical modeling and computer vision
 - Thesis co-supervision of MS and PhD students
- 2011 - 2014 RESEARCH SCIENTIST
Center For Imaging Science
Institute For Computational Medicine
Johns Hopkins University, Baltimore, MD, USA
- Development of algorithms for information theoretic sequential scene understanding
 - Development of algorithms for view-invariant object detection and 3D pose estimation
 - Statistical modeling of cell signaling networks with genetic/epigenetic variations
- SUPERVISORS: Donald Geman, Laurent Younes, René Vidal, Michael Ochs
- 2006 - 2011 RESEARCH ASSISTANT
Center For Imaging Science
Institute For Computational Medicine
Johns Hopkins University, Baltimore, MD, USA
- Theory and design of nested latent variable Markov forests for robust learning from high dimensional and small sample data
 - Comprehensive statistical modeling of protein signaling networks
- SUPERVISORS: Donald Geman, Laurent Younes, Michael Ochs
- 2004 - 2005 RESEARCH ASSISTANT
Volumetric Analysis & Visualization Group
Boğaziçi University, İstanbul, Turkey
- Development of algorithms for structure preserving regularization of MR-DTI
 - Development of algorithms for brain white matter connectivity and fiber tractography
- SUPERVISOR: Burak Acar
- 2002 - 2004 RESEARCH ASSISTANT
Signal & Image Processing Laboratory
Boğaziçi University, İstanbul, Turkey
- Development of image recognition algorithms for person authentication based on hand shapes and appearances
- SUPERVISOR: Bülent Sankur

- İ. Baz, E. Yörük, M. Çetin, “Context-Aware Confidence Sets for Fine-Grained Product Recognition”, IEEE Access, vol. 7, no. 1, pp. 76376-76393, 2019.
- C. B. Akgül, E. Yörük, F. Mohideen, “Intel and Vispera ShelfSight: Effective On-Shelf Inventory Management for Grocers”, Intel Whitepaper on Retail and Internet of Things, 2018.
- N. Marvasti, E. Yörük, B. Acar, “Computer-Aided Medical Image Annotation: Preliminary Results with Liver Lesions in CT”, IEEE Journal of Biomedical and Health Informatics, vol. 22, no. 5, pp. 1561-1570, 2017.
- E. Jahangiri, E. Yörük, R. Vidal, L. Younes, D. Geman. “Information Pursuit: A Bayesian Framework for Sequential Scene Parsing”, arXiv preprint arXiv:1701.02343, 2017.
- İ. Baz, E. Yörük, M. Çetin, “Retail Product Recognition with a Graphical Shelf Model”, Proceedings of Signal Processing and Communications Applications Conference (IEEE - SIU), 2017.
- E. Yörük, K. T. Öner, C. B. Akgül, “An Efficient Hough Transform for Multi-Instance Object Recognition and Pose Estimation”, Proceedings of International Conference on Pattern Recognition (ICPR), pp. 1352-1357, 2016 (**Intel Track 2 Best Paper Finalist**).
- İ. Baz, E. Yörük, M. Çetin, “Context-Aware Hybrid Classification System For Fine-Grained Retail Product Recognition”, Proceedings of IEEE Image, Video and Multi-Dimensional Signal Processing-Workshop, 2016.
- E. Yörük, R. Vidal, “Efficient Object Localization and Pose Estimation with 3D Wireframe Models”, Proceedings of International Conference on Computer Vision - 4th International IEEE Workshop on 3D Representation and Recognition (ICCV - 3dRR), pp. 538-545, 2013 (**Recipient of Microsoft Research Best Paper Award**).
- E. Yörük, M. F. Ochs, D. Geman, L. Younes, “A Comprehensive Statistical Model for Cell Signaling”, IEEE Transactions on Computational Biology and Bioinformatics, vol., 8 no. 3, pp. 592-606, 2011.
- H. Dutağacı, G. Fouquier, E. Yörük, B. Sankur, L. Likforman-Sulem, J. Darbon, “Hand Recognition”, Guide to Biometric Reference Systems and Performance Evaluation, D. Petrovska-Delacretaz, G. Chollet, B. Dorizzi (Eds.), pp. 89-124, Springer, 2009.
- B. Acar, E. Yörük, “DT-MRI Connectivity and/or Tractography?: Two New Algorithms”, Tensors in Image Processing and Computer Vision, S. Aja-Fernández, R. de Luis García, D. Tao, and X. Li (Eds.), Series: Advances in Pattern Recognition, pp. 335-353, Springer, 2009.
- H. Dutağacı, B. Sankur, E. Yörük, “A Comparative Analysis of Global Hand Appearance Based Recognition”, Journal of Electronic Imaging, vol. 17, no 1, pp. 011018/1- 011018/19, 2008.
- E. Yörük, H. Dutağacı, B. Sankur, “Hand Biometrics”, Image and Vision Computing, vol. 24, no. 5, pp. 483-497, 2006.
- E. Yörük, E. Konukoğlu, B. Sankur, J. Darbon, “Shape-Based Hand Recognition”, IEEE Transactions on Image Processing, vol. 15, no. 7, pp. 1803-1815, 2006.
- E. Yörük, B. Acar, R. Bammer, “A Physical Model for DT-MRI Based Connectivity Map Computation”, Proceedings of International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), pp. 213-220, 2005.
- E. Yörük, B. Acar, “Structure Preserving Regularization of DT-MRI Vector Fields By Nonlinear Anisotropic Diffusion Filtering”, Proceedings of European Signal Processing Conference (EUSIPCO), pp. 1-4, 2005.
- E. Yörük, H. Dutağacı, B. Sankur, “Hand Based Biometry”, Proceedings of the IEEE Signal Processing and Communications Applications Conference (IEEE-SIU), pp. 456-459, 2005.
- E. Yörük, H. Dutağacı, B. Sankur, “Hand Based Biometry”, Proceedings of Image and Video Communications and Processing Conference (SPIE), vol. 5685, pp. 1106-1115, 2005.
- E. Yörük, E. Konukoglu, B. Sankur, J. Darbon. *Person Authentication Based On Hand Shape*. Proceedings of European Signal Processing Conference (EUSIPCO), pp. 1233-1236, 2004.
- E. Yörük, E. Konukoglu, B. Sankur, J. Darbon, “Person Authentication based on Hand Shape”, Proceedings of IEEE Signal Processing and Communications Applications Conference (IEEE-SIU), pp. 152-155, 2004 (**recipient of Alper Atalay best student paper award**).
- E. Yörük, C. B. Akgül, “Color Image Segmentation using PDE-based Regularization and Watershed Transformation”, Proceedings of IEEE Signal Processing and Communications Applications Conference (IEEE-SIU), pp. 518-521, 2004.

INVITED TALKS

- “Vispera Shelvesight with Cisco Meraki” Cisco Connect Türkiye, September 2020.
- “ShelfSight - Real Time Shelf Monitoring and Management System” Intel Global IoT DevFest IV, June 2019.
- “Visual Intelligence for Retail”, Inzva Algorithmics and AI Community, İstanbul, Turkey, March 2019.
- “Visual Intelligence for Retail”, NVidia Inception Meetup, İTÜ Teknokent, İstanbul, Turkey, March 2019.
- “Yapay Görme ve Derin Öğrenme Yöntemlerinin Perakende Sektörüne Uygulanması”, Boğaziçi University Compec Datacamp 2018, İstanbul, Turkey, November 2018.
- “Perakende Alanında Yapay Görme ve Derin Öğrenme”, DeepCon’18, Turkey Deep Learning Conference, October 2018.
- “Perakende ve Yapay Zeka”, Türkiye Yapay Zeka İnisyatifi TRAI Meet-up, İTÜ Teknokent, İstanbul, Turkey, December 2017.
- “A Comprehensive Statistical Model for Cell Signaling”, Seven Bridges Genomics, Boston, MA, USA, April 2017.
- “A Comprehensive Statistical Model for Cell Signaling”, Acıbadem University, İstanbul, Turkey, May 2016.
- “Probabilistic Graphical Models: Novel Applications in Machine Learning, Bioinformatics and Computer Vision”, Boğaziçi University, İstanbul, Turkey, February 2014.

PATENTS

- **E. Yörük**, K. T. Öner, C. B. Akgül, “Electronic Detection of Products, Poses of Products, and Arrangement of Products in a Display Structure, Electronic Scoring of the Detected Product Poses and Product Arrangement, and Electronic Generation of a Reference Image of a Product in its Canonical Pose”, PCT/TR2017/050620, 2017.
- **E. Yörük**, C. B. Akgül, “Perakende Ürün Tanıma, Sayma, Konumlandırma Sistemi”, TPE No. 2015/02320, 2015.

GRANTS

- PERAZEKA, AKILLIRAF, AKILLIKABİN, AKILLIFİYAT, ARAF, KABİNSAYAR - Türkiye Bilim, Sanayi ve Teknoloji Bakanlığı, Bilim ve Teknoloji Genel Müdürlüğü AR-GE Merkezi Kurulum Projeleri, 2017 - Present.
- PERASKOR - Görüntü İşlemeye Dayalı Perakende Kabini Skorlama, TÜBİTAK - AGY101-02, 2016 - 2017.
- MOKA - Mobil Kamera Görüntülerinden Nesne Tanıma Uygulamaları, TÜBİTAK - AGY101-02, 2015 - 2016.
- PERASAY - Perakende Ürün Tanıma, Sayma, Konumlandırma, TÜBİTAK - AGY101-02, 2014 - 2015.

HONORS AND AWARDS

- ICPR 2016 - Finalist Best Intel Track 2 Paper Award for the paper entitled *An Efficient Hough Transform for Multi-Instance Object Recognition and Pose Estimation*, 2016.
- ICCV 2013 - 3dRRR Microsoft Research Best Paper Award for the paper entitled *Efficient Object Localization and Pose Estimation with 3D Wireframe Models*, 2013.
- Computer Vision Summer School, Institute for Pure and Applied Mathematics, University of California, Los Angeles, July 22 - August 9, attendee with full financial support, 2013.
- H. Cohen Fellowship for academic excellence, 2009 - 2010
- Scientific and Research Foundation of Turkey (TUBİTAK) scholarship, 2005 - 2006.
- Alper Atalay Best Student Paper Award for the paper entitled *Shape Based Hand Recognition* in IEEE-SIU, 2004.
- Boğaziçi University Dean’s Honor Roll, 2002
- Alper Atalay fellowship for academic excellence, 2000 - 2002
- Boğaziçi University scholarship, 1998 - 2002
- ERDEMİR Vakfı scholarship, 1997 - 2002
- Deutscher Akademischer Austauschdienst (DAAD) scholarship, 1997.

TEACHING EXPERIENCE

INSTRUCTOR	ELECTRICAL & ELECTRONICS ENGINEERING, BOĞAZIÇI UNIVERSITY SPRING 2015/16: EE 583 Probabilistic Graphical Models
GUEST LECTURER	ELECTRICAL & ELECTRONICS ENGINEERING, BOĞAZIÇI UNIVERSITY SPRING 2018/19: EE 580 Data Mining for Visual Media SPRING 2018/19: EE 475 Image Processing PSYCHOLOGY, KOÇ UNIVERSITY SPRING 2017: PSYC 348 Introduction to Cognitive Science
TEACHING ASSISTANTSHIPS	APPLIED MATHEMATICS & STATISTICS, JOHNS HOPKINS UNIVERSITY SPRING 2008: AMS 640 Machine Learning SPRING 2006: AMS 111 Statistical Analysis FALL 2005: AMS 291 Linear Algebra and Differential Equations FALL 2005: AMS 303 Differential Equations ELECTRICAL & ELECTRONICS ENGINEERING, BOĞAZIÇI UNIVERSITY SPRING 2003/04/05: EE 574 Special Topics in Image Processing SPRING 2003/04/05: EE 202 Electric Circuits 2 FALL 2003/04: EE 677 Detection Estimation Theory FALL 2003/04: EE 497 Java Programming FALL 2003/04: EE 479 Communication Laboratories FALL 2002: EE 210 Electric Circuits 1
STUDENT ADVISING	THESIS CO-ADVISOR 2020-PRESENT: Orhan Eren Akgün, Electrical & Electronics Engineering, Boğaziçi University 2019-2020: Özgün Karagöz, Electrical & Electronics Engineering, Boğaziçi University 2019-2020: Burak Bozbey, Electrical & Electronics Engineering, Boğaziçi University 2014-2019: İpek Baz, Engineering and Natural Sciences, Sabancı University 2014-2017: Sinem Aslan, Electrical & Electronics Engineering, Boğaziçi University 2014-2017: Neda Marvasti, Electrical & Electronics Engineering, Boğaziçi University 2015-2016: Alper Aydın, Electrical & Electronics Engineering, Boğaziçi University 2011-2014: Ehsan Jahangiri, Electrical & Computer Engineering, Johns Hopkins University 2011-2014: Siddharth Mahendran, Electrical & Computer Engineering, Johns Hopkins University

PROFESSIONAL ACTIVITIES

LEAD GUEST EDITOR	Advances in Multimedia, Special Issue on <i>Scene Understanding and Product Recognition in Retail Environments</i> .
REVIEWER	Computer Vision and Image Understanding, IEEE Transactions in Computational Biology and Bioinformatics, BMC Bioinformatics, EUASIP Journal of Advances in Signal Processing, Turkish Journal of Electrical Engineering and Computer Sciences, Conference on Computer Vision and Pattern Recognition, International Conference on Computer Vision, European Conference on Computer Vision, Iberoamerican Congress on Pattern Recognition.
JURY MEMBER	“Alper Atalay Best Student Paper Award” 24th IEEE Conference on Signal Processing and Communications Applications, Zonguldak, Turkey, 2016.
ORGANIZING MEMBER	23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Istanbul, Turkey, 2001.

SKILLS

LANGUAGES	Turkish (native), English (fluent), German (fluent with Sprachdiplom)
PROGRAMMING	MATLAB, Python, C/C++, TensorFlow, OpenCV