

ERDEM YÖRÜK, PH.D.

CONTACT INFORMATION

ADDRESS Nispetiye Mah. Birlik Sok. Bimak 1 Apt. 13/7 Levent, Beşiktaş, İstanbul, Turkey
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RESEARCH INTERESTS

MACHINE LEARNING Probabilistic Graphical Models, Bayesian Networks, Information Theory, Dependency Pursuit, Small Sample Learning, MCMC Methods, Stochastic Processes

COMPUTER VISION View-Invariant Object Detection, 3D Object Representations, Adaptive Scene Understanding, Scene/Image Priors, Medical Imaging, Biometrics

BIOINFORMATICS Biomolecular Network Modeling, Protein Signaling Networks, Gene Regulatory Networks, Biomarker Discovery, Oncology Biostatistics

CURRENT EMPLOYMENT

2014 - PRESENT SENIOR RESEARCH SCIENTIST
Vispera Information Technologies
Nispetiye Mah. Başa Sok. Gülüm Apt. 10/4 Levent, Beşiktaş, İstanbul, Turkey

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.
(attended the Ph.D. program in the same department and completed course requirements)

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

1989 - 1997 İSTANBUL ERKEK LİSESİ, İSTANBUL, TURKEY
(Graduated as top student)

PROFESSIONAL EXPERIENCE

- 2014 - PRESENT SENIOR RESEARCH SCIENTIST
Vispera Information Technologies, Co.
İstanbul, Turkey
RESPONSIBILITIES:
- Leading the research team of the company
 - Design and development of automated vision systems for recognizing and counting packaged products in retail stores from mobile camera images
 - Technical leader for TÜBİTAK - PERASAY project
 - Co-advising Ph.D. students in joint projects with the company
- 2015 - PRESENT ADJUNCT FACULTY
Department of Electrical & Electronics Engineering
Boğaziçi University, İstanbul, Turkey
RESPONSIBILITIES:
- Instructor for graduate level courses
 - Co-advising Ph.D. students
- 2011 - 2014 POSTDOCTORAL RESEARCHER
Center For Imaging Science
Institute For Computational Medicine
Johns Hopkins University, Baltimore, MD, USA
RESPONSIBILITIES:
- Development of vision systems for information theoretic scene understanding with adaptive selective attention and sequential uncertainty reduction
 - Development of vision systems for view-invariant object detection and 3D pose estimation from a single visible light image
 - Development of statistical models for cell signaling networks with genetic/epigenetic variations and extracellular feedback
- SUPERVISORS: Donald Geman, Ph.D.; Laurent Younes, Ph.D.; René Vidal, Ph.D.; Michael Ochs, Ph.D.
- 2006 - 2011 RESEARCH ASSISTANT
Center For Imaging Science
Institute For Computational Medicine
Johns Hopkins University, Baltimore, MD, USA
RESPONSIBILITIES:
- Development of latent variable Markov models for robust dependency learning from high dimensional small sample data
 - Comprehensive statistical modeling of protein signaling networks in cell proliferation for elucidating disease mechanisms in breast cancer
- SUPERVISORS: Donald Geman, Ph.D.; Laurent Younes, Ph.D.; Michael Ochs, Ph.D.
- 2004 - 2005 RESEARCH ASSISTANT
Volumetric Analysis & Visualization Group
Boğaziçi University, İstanbul, Turkey
RESPONSIBILITIES:
- Development of algorithms for structure preserving regularization of MR-DTI
 - Computation of brain white matter connectivity maps and fiber tractography
- SUPERVISOR: Burak Acar, Ph.D.

2002 - 2004

RESEARCH ASSISTANT
Signal & Image Processing Laboratory
Boğaziçi University, İstanbul, Turkey
RESPONSIBILITIES:

- Development of hand-based biometric systems

SUPERVISOR: Bülent Sankur, Ph.D.

PUBLICATIONS *Google scholar citations: 393, h-index: 6*

MANUSRIPTS IN PREPARATION

- **E. Yörük**, E. Jahangiri, D. Geman, L. Younes, B. Jedynek, R. Vidal. *Entropy Pursuit: Adaptive Scene Understanding with Coarse-to-Fine Selective Attention and Sequential Uncertainty Reduction*.
- **E. Yörük**, M. Ochs, D. Geman, L. Younes. *A Statistical Formulation of Cell Signaling with Extra-cellular Feedback and Genetic Variation*.
- S. Mahendran, **E. Yörük**, R. Vidal. *Semantic Segmentation and Categorization with Bottom-up Conditional Random Fields and Top-Down 3D Detections*
- **E. Yörük**, R. Vidal. *Joint Homography Estimation and Multi-Class Object Recognition using 3D Wireframe Models and Branch-and-Bound*

PEER REVIEWED JOURNALS AND CONFERENCES

- **E. Yörük**, R. Vidal. *A Computationally Efficient Approach to 3D Model Matching for 3D Object Localization and Fine-Grained 3D Pose Estimation from a Single 2D Image*. International Conference on Computer Vision - 4th International IEEE Workshop on 3D Representation and Recognition (ICCV - 3dRR), 2013. **recipient of best paper award sponsored by Microsoft Research**
- D. Rother, **E. Yörük**, S. Mahendran, R. Vidal. *Hypothesize and Bound: A Computational Focus of Attention Mechanism for Simultaneous 3D Shape Reconstruction, Pose Estimation and Classification from a Single 2D Image*. International Journal of Computer Vision, 2013. under revision.
- **E. Yörük**, M. F. Ochs, D. Geman, L. Younes. *A Comprehensive Statistical Model for Cell Signaling*. IEEE Transactions on Computational Biology and Bioinformatics, 8(3), pp. 592-606, 2011.
- H. Dutağacı, B. Sankur, **E. Yörük**. *A Comparative Analysis of Global Hand Appearance Based Recognition*. Journal of Electronic Imaging, 17(1), pp. 011018/1- 011018/19, 2008.
- **E. Yörük**, H. Dutağacı, B. Sankur. *Hand Biometrics*. Image and Vision Computing, 24(5), pp. 483-497, 2006.
- **E. Yörük**, E. Konukoğlu, B. Sankur, J. Darbon. *Shape-Based Hand Recognition*. IEEE Transactions on Image Processing, 15(7), pp. 1803-1815, 2006.
- **E. Yörük**, B. Acar, R. Bammer. *A Physical Model for DT-MRI Based Connectivity Map Computation*. International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2005.
- **E. Yörük**, B. Acar. *Structure Preserving Regularization of DT-MRI Vector Fields By Nonlinear Anisotropic Diffusion Filtering*. European Signal Processing Conference (EUSIPCO), 2005.
- **E. Yörük**, H. Dutağacı, B. Sankur. *Hand Based Biometry*. SPIE, 2005.
- **E. Yörük**, E. Konukoglu, B. Sankur, J. Darbon. *Shape Based Hand Recognition*. IEEE Signal Processing and Telecommunication Applications Conference (IEEE-SIU), 2004. **recipient of Alper Atalay best student paper award**
- **E. Yörük**, E. Konukoglu, B. Sankur, J. Darbon. *Person Authentication Based On Hand Shape*. European Signal Processing Conference (EUSIPCO), 2004.

- **E. Yörük**, C. B. Akgül. *Color Image Segmentation using PDE-based Regularization and Watershed Transformation*. IEEE Signal Processing and Telecommunication Applications Conference (IEEE-SIU), 2004.

BOOK CHAPTERS

- 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.

GRANTS

2014 - Present TUBİTAK - AGY101-02 KOBİ AR-GE Başlangıç Destek Programı- "PERASAY" Project

PATENTS

2015 "Perakende ürün tanma, sayma, konumlandırma sistemi" TPE No. 2015/02320 Patent Pending

HONORS AND AWARDS

2013 ICCV 2013 - 3dRRR Microsoft Research Best Paper Award for the paper entitled *A Computationally Efficient Approach to 3D Model Matching for 3D Object Localization and Fine-Grained 3D Pose Estimation from a Single 2D Image*

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

2009 - 2010 H. Cohen Fellowship for academic excellence

2005 - 2006 Scientific and Research Foundation of Turkey (TUBİTAK) scholarship

2004 Alper Atalay Best Student Paper Award for the paper entitled *Shape Based Hand Recognition* in IEEE-SIU 2004

2002 Boğaziçi University Dean's Honor Roll

2000 - 2002 Alper Atalay fellowship for academic excellence

1998 - 2002 Boğaziçi University scholarship

1997 - 2002 ERDEMİR Vakfı scholarship

1997 Deutscher Akademischer Austauschdienst (DAAD) scholarship

1997 Ranked 84th and 92nd in the two consecutive nationwide university entrance exams

1997 Ranked first in graduation from İstanbul Erkek Lisesi (GPA 10.0/10.0)

TEACHING EXPERIENCE

INSTRUCTOR ELECTRICAL AND ELECTRONICS ENGINEERING, COMPUTER ENGINEERING, BOĞAZIÇI UNIVERSITY
 SPRING 2015: EE 583, CMPE 583 Probabilistic Graphical Models

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 RESEARCH MENTOR/CO-ADVISOR FOR PH.D. STUDENTS
2014 - PRESENT: Ipek Baz, Engineering and Natural Sciences, Sabancı University
2014 - PRESENT: Sinem Aslan, Electrical & Electronics Engineering, Boğaziçi University
2014 - PRESENT: Neda Marvasti, 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

TEACHING INTERESTS Probability and Statistics
Probabilistic Graphical Models
Computational Biology and Bioinformatics
Computational Functional Genomics
Machine Learning
Computer Vision
Digital Signal and Image Processing
Signals and Systems
Stochastic Processes
Detection Estimation Theory
Mathematical Methods in Signal Processing

PROFESSIONAL ACTIVITIES

REVIEWER EUASIP Journal of Advances in Signal Processing
Computer Vision and Image Understanding
BMC Bioinformatics
IEEE TCBB
CVPR 2013, 2014, 2015
ICCV 2013, 2015
CIARP 2013

ORGANIZING MEMBER 23rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Istanbul, Turkey, 2001

COMPUTER SKILLS

PROGRAMMING MATLAB, C/C++, Python, R, Java, Mathematica
WORD PROCESSING \LaTeX , Beamer, Keynote, MS Word, Powerpoint, Excel
ELECTRONIC DESIGN Motorola 8-bit Microcontroller Assemblers, Electronic Workbench, Spice

LANGUAGES

TURKISH Native
ENGLISH Fluent
GERMAN Fluent with Sprachdiplom

REFERENCES

DONALD GEMAN PROFESSOR
Applied Mathematics & Statistics
Center for Imaging Science
Institute for Computational Medicine

Johns Hopkins University, Baltimore, MD
Ecole Normale Supérieure, Cachan, France
ADDRESS: 302A Clark Hall, 3400 North Charles St. Baltimore, MD, 21218, USA
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LAURENT YOUNES

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RENÉ VIDAL

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Biomedical Engineering
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AYTÜL ERÇİL

PROFESSOR
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