

CIGDEM BEYAN

Date of Birth: 01/04/1987

Place of Birth: Ankara, Turkey

Current Email: Cigdem.Beyan@iit.it

EDUCATION

- 2015 PhD.** University of Edinburgh, UK
School of Informatics
Institute of Perception, Action and Behaviour (IPAB)
Thesis Title: Detection of Unusual Fish Trajectories from Underwater Videos
Supervisor: Robert Fisher
Co-Supervisor: Vittorio Ferrari
- 2010 MSc.** Middle East Technical University (METU), TURKEY
Graduate School of Informatics
Department of Information Systems
GPA: 3.88/4.00
Thesis Title: Object Tracking for Surveillance Applications Using Thermal and Visible Band Video Data Fusion
Supervisor: Alptekin Temizel
- 2008 BEng.** Baskent University, TURKEY
Faculty of Engineering
Department of Computer Engineering
GPA: 3.64/4.00 High Honour (Ranked second among the graduates of that year)
Thesis Title: Cancer Diagnosis with Gene Expression Data
Supervisor: Hasan Ogul

CURRENT POSITION

- Since September 2015** Postdoctoral Researcher
Department of Pattern Analysis & Computer Vision
Istituto Italiano di Tecnologia (IIT), Genoa, Italy

PREVIOUS POSITIONS

May 2015- July 2015

Course Assistant
for Preparing Practical Assignments
Introduction to Vision and Robotics Course
University of Edinburgh
School of Informatics
Edinburgh, UK
<http://www.inf.ed.ac.uk/teaching/courses/ivr/>

September 2011- May 2015

Guest Lecturer, Teaching Assistant, Tutor, Marker
and Demonstrator
University of Edinburgh
School of Informatics
Edinburgh, UK

September 2008- 2011

Research/ Teaching Assistant,
Baskent University
Department of Computer Engineering
Ankara, Turkey

June 2007

Intern
Meteksan System
Corporate Resolution and Software Development
Ankara, Turkey

June 2006

Intern
Siemens Turkey
Ankara, Turkey

RESEARCH PROJECTS

February 2020-Ongoing	Autonomous Monitoring of Patients using Sensor Networks.
September 2018-Ongoing	Social Scene Understanding: Multi-Person Action Localization, Social Group Behavior Analysis, Voice Activity Detection by Body Motion Analysis, Unsupervised Methods for Social Interaction Analysis.
September 2016-January 2017	Deception Detection using Multi-modal (Deep/ Hand-crafted) Nonverbal Features http://pavis.iit.it/projects/deception-detection
September 2015-September 2017	Multi-modal Identification of Leaders in Small Group Social Interactions https://www.iit.it/datasets/leadership-corpus-dataset
September 2011-May 2015	Fish4Knowledge Project (the European Union Seventh Framework Programme [FP7/2007-2013] under grant agreement 257024, 2011-2013) Behaviour analysis of fish in live undersea video recordings (A part of PhD. Thesis) http://groups.inf.ed.ac.uk/f4k/
September 2009-December 2010	<ul style="list-style-type: none">• Object Tracking for Surveillance Applications using Thermal and Visible Band Video Data Fusion (Msc. Thesis)• Fusion of Thermal and Visible Band Video for Abandoned Object Detection METU Computer Vision and Remote Sensing Research Group http://ii.metu.edu.tr/virtual-reality-and-computer-vision-research-group
September 2009-2011	Probabilistic Modelling of miRNA mRNA Duplexes Baskent University Bioinformatics and Bio-inference Research Group http://www.baskent.edu.tr/~hogul/research.htm
September 2008-June 2008	Cancer Diagnosis with Gene Expression Data (BEng. Thesis)

AWARDS

- Became **Associate Fellow of the Higher Education Academy** in recognition of attainment against the UK Professional Standards Framework for teaching and learning support in higher education (18/11/2014). <http://www.heacademy.ac.uk/>
- **Edinburgh Global Overseas Research Scholarship** (2011-2014)
<http://www.ed.ac.uk/schools-departments/student-funding/postgraduate/international/global/research>
- **Principal Career Development Scholarship, University of Edinburgh** (2011-2014) <http://www.ed.ac.uk/schools-departments/student-funding/postgraduate/uk-eu/university-scholarships/development>
<https://www.ed.ac.uk/student-funding/postgraduate/scholar-case-studies>
- **Best Thesis Award**
Given by Prof. Dr. Mustafa N. Parlar Education and Research Foundation, Middle East Technical University, Ankara, Turkey, Thesis of the year award, 2011.
- **2010-2011 Academic year Best Thesis Award**
Given by Middle East Technical University to Postgraduate Thesis including all institutes, <http://ii.metu.edu.tr/awarded-theses>
- **Alper Atalay Best Student Paper Award, first place**
19th IEEE Conference on Signal Processing and Communications Applications, April 2011, <http://vpa.sabanciuniv.edu/links/bupam/alper/odul.htm>
- **SPIE Student Travel Grant**, SPIE Defense, Security, and Sensing Symposium, April 2011.
- **2007-2008 Academic Year Baskent University Academic Achievement Scholarship**, High Honour (GPA: 3.72/4.00)
- **2006-2007 Academic Year Baskent University Academic Achievement Scholarship**, High Honour (GPA: 3.73/4.00)

SCIENTIFIC ACTIVITIES

Journal Reviewer

- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Multimedia
- IEEE Transactions on Affective Computing
- IEEE Transactions on Knowledge and Data Engineering
- Pattern Recognition
- Machine Vision and Applications
- IEEE Multimedia
- IEEE Access
- IET Computer Vision
- IET Image Processing
- Expert Systems with Applications
- EURASIP Journal on Image and Video Processing
- ICES Journal of Marine Science
- Frontiers Psychology
- Electronics Letters

International Conference Reviewer

- Conference on Computer Vision and Pattern Recognition (CVPR) 2017, 2018, 2019
- Conference on Neural Information Processing Systems (NIPS) 2016, 2017
- European Conference on Computer Vision (ECCV) 2020
- British Machine Vision Conference (BMVC) 2017
- International Conference on Pattern Recognition (ICPR) 2014, 2016, 2018, 2020
- International Conference on Motion and Computing (MOCO) 2018, 2020
- Multimodal Learning and Applications Workshop (MULA) 2018
- ICCV Workshop on Action Recognition with a Large Number of Classes (THUMOS) 2013
- International Conference on Affective Computing and Intelligent Interaction (ACII) 2019
- ACM International Conference on Multimedia (ACMMM) 2019
- ACM International Conference on Multimodal Interaction (ICMI) 2019

National (Turkish) Conference Reviewer

- IEEE Sinyal İşleme ve İletişim Uygulamaları (SIU) 2018

Program Committee

- ACM International Conference on Multimedia (ACMMM) 2019
- International Conference on Human Computer Interaction Theory and Applications (HUCAPP) 2019, 2020

HUCAPP is a part of VISIGRAPP, the 14th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications.

<http://www.hucapp.visigrapp.org/?y=2019>

- Doctoral Consortium of the International Conference on Affective Computing and Intelligent Interaction (ACII) 2019

<http://acii-conf.org/2019/doctoral-consortium/>

Workshop Co-organizer

- 2nd Workshop on Applications of Egocentric Vision (EgoApp), in International Conference on Pattern Recognition (ICPR) 2020, Milan, Italy, *with Maya Aghaei (IIT, Italy), Fernando De la Torre (Facebook Research, USA), Vittorio Murino (Huawei, Ireland), Lorenzo Natale (IIT, Italy), Alessio Del Bue (IIT, Italy)*. Accepted among 49 proposals.
- Applications of Egocentric Vision Workshop (EgoApp), in British Machine Vision Conference (BMVC) 2019, Cardiff, UK, *with Maya Aghaei (IIT, Italy), Fernando De la Torre (Facebook Research, USA), Vittorio Murino (IIT, Italy)*.

Guest Editor

- Frontiers in Robotics and AI:

Computational Approaches for Human-Human and Human-Robot Social Interactions

<https://www.frontiersin.org/research-topics/8447/computational-approaches-for-human-human-and-human-robot-social-interactions>

Associate Editor

- ICES Journal of Marine Science (18 September 2018-Ongoing):

Covering area of applications of computer vision and machine learning in marine science.

https://academic.oup.com/icesjms/pages/Editorial_Board

Invited Talks

- Social Signal Processing Approaches for Emergent Leadership

In Department of Multimedia Informatics, Graduate School of Informatics, Middle East Technical University, Ankara, Turkey, December 27, 2017.

<https://ii.metu.edu.tr/announcement/social-signal-processing-approaches-dr-cigdem-beyan>

- Voice Activity Detection by Upper Body Motion Analysis and Unsupervised Domain Adaptation, In IIT-RIKEN Joint Workshop, Genoa, Italy, September 24-25, 2019.

RESEARCH INTEREST

- Nonverbal Analysis of Multimodal Interactions/ Social Signal Processing: Leadership Identification, Personality Trait Analysis, Deception Detection, Affect Classification, etc.
- Computer Vision: Trajectory Analysis, Anomaly Detection, Object Detection/Tracking, Behaviour Understanding, Learning and Analysing Motion Dynamics of a Video, etc.
- Machine (Deep) Learning: Classification for Imbalanced Data, Active Learning, Unsupervised Learning, Domain Adaptation, etc.

PUBLICATIONS

Google Scholar Citations

<http://scholar.google.com/citations?user=VmjUxckAAAAJ&hl=tr>

International Patents

[IP01]	A.Temizel, C.Beyan , "A Method for Individual Tracking of Multiple Objects", PCT Patent Application to WIPO, WO/2012/141663, PCT/TR2011/000082, 13 April 2011.
--------	---

Book Chapters

[B03]	C. Beyan , "Unusual Trajectory Detection: Advances", In Encyclopedia of Image Processing, 1st Edition, Phillip A. Laplante (Editor), Taylor & Francis Group: New York, pp: 766-781, doi: 10.1201/9781351110273-140000116.
[B02]	C. Beyan , "Fish Behavior Analysis", In Fish4Knowledge: Collecting and Analyzing Massive Coral Reef Fish Video Data, Chen-Burger et al. (Editors), Springer, doi: 10.1007/978-3-319-30208-9.
[B01]	C. Beyan , and R. B. Fisher, "Hierarchal Decomposition for Unusual Fish Trajectory Detection", In Computer Vision and Pattern Recognition in Environmental Informatics, Zhou et al. (Editors), IGI Global, doi: 10.4018/978-1-4666-9435-4.ch001.

Refereed International Journals Papers

[IJ13]	C. Beyan , A. Zunino, M. Shahid and V. Murino, "Personality Traits Classification Using Deep Visual Activity-based Nonverbal Features of Key-Dynamic Images", IEEE Transactions on Affective Computing, 2019. doi: 10.1109/TAFFC.2019.2944614.
[IJ12]	F. Capozzi, C. Beyan , A. Pierro, A. Koul, V. Murino, S. Livi, A. P. Bayliss, L. Ristic, C. Becchio, "Tracking The Leader: Gaze Behaviour In Group Interactions", ISCIENCE, 16, pp. 242-249, 2019. doi: https://doi.org/10.1016/j.isci.2019.05.035 .
[IJ11]	C. Beyan , V. M. Katsageorgiou, V. Murino, "A Sequential Data Analysis Approach to Detect Emergent Leaders in Small Groups", IEEE Transactions on Multimedia, vol. 21, no. 8, pp. 2107-2116, 2019. doi: 10.1109/TMM.2019.2895505.
[IJ10]	C. Beyan , V. M. Katsageorgiou, R. Fisher, "Extracting Statistically Significant Behaviour from Fish Tracking Data With and Without Large Dataset Cleaning", IET Computer Vision, vol. 12, no. 2. pp. 162-170, 2018. doi: 10.1049/iet-cvi.2016.0462.
[IJ09]	C. Beyan , F. Capozzi, C. Becchio, and V. Murino, "Prediction of the Leadership Style of an Emergent Leader Using Audio and Visual Nonverbal Features", IEEE Transactions on Multimedia, vol. 20, no. 2, pp. 441-456, 2018. doi: 10.1109/TMM.2017.2740062.
[IJ08]	C. Beyan , B. Boom, J. Liefhebber, K-T Shao, and R. Fisher, "Natural Swimming Speed of <i>Dascyllus reticulatus</i> Increases with Water Temperature", ICES Journal of Marine Science, vol. 72, no. 8, pp. 2506-2511, 2015. doi: 10.1093/icesjms/fsv104.
[IJ07]	C. Beyan , R. Fisher, "Classifying Imbalanced Data Sets Using Similarity Based Hierarchical Decomposition", Pattern Recognition, vol. 48, no. 5, pp. 1653-1672, 2015. doi: 10.1016/j.patcog.2014.10.032.
[IJ06]	C. Beyan , A. Temizel, "A Multimodal Approach for Individual Tracking of People and Their Belongings", Imaging Science Journal, vol. 63, no. 4, pp. 192-202, 2015. doi: 10.1179/1743131X14Y.0000000101.
[IJ05]	S. McDonagh, C. Beyan , P. X. Huang and R. B. Fisher, "Applying semi-synchronised task farming to large-scale computer vision problems",

	International Journal of High Performance Computing Applications, vol. 29. no. 4, pp. 1-24, 2015. doi: 10.1177/1094342014532965.
[IJ04]	B. J. Boom, J. He, S. Palazzo, P. X. Huang, C. Beyan , H. Chou, F. Lin, C. Spampinato, R. B. Fisher, "A research tool for long-term and continuous analysis of fish assemblage in coral-reefs using underwater camera footage", Ecological Informatics, vol. 23, pp. 83-97, 2014. doi: 10.1016/j.ecoinf.2013.10.006.
[IJ03]	C. Spampinato, E. Beauxis-Aussalet, S. Palazzo, C. Beyan , J. van Ossenbruggen, J. He, B. Boom, X. Huang, "A rule-based event detection system for real-life underwater domain", Machine Vision and Applications, vol. 25, no. 1, pp. 99-117, 2014. doi: 10.1007/s00138-013-0509-x.
[IJ02]	C. Beyan , A. Temizel, "Adaptive Mean-Shift for Automated Multi Object Tracking", IET Computer Vision, vol. 6 no.1 pp. 1-12, 2012. doi: 10.1049/iet-cvi.2011.0054.
[IJ01]	C. Beyan , A. Yigit, A. Temizel, "Fusion of Thermal and Visible Band Video for Abandoned Object Detection", SPIE Journal of Electronic Imaging, vol. 20, no. 3, 033001, 2011. doi: 10.1117/1.3602204.

Refereed International Conference/Workshop Papers

[IC17]	M. Shahid*, C. Beyan* , V. Murino, "Voice Activity Detection by Upper Body Motion Analysis and Unsupervised Domain Adaptation". In Proceedings of International Conference on Computer Vision (ICCV) Workshops, (10 th International Workshop on Human Behavior Understanding), pp. 1260-1269, 2019. doi: 10.1109/ICCVW.2019.00159 <i>* <u>indicates equal contribution</u></i>
[IC16]	M. Shahid*, C. Beyan* , V. Murino, "Comparisons of Visual Activity Primitives for Voice Activity Detection". In Proceedings of Image Analysis and Processing (ICIAP), Lecture Notes in Computer Science, vol. 11751, E. Ricci, S. Rota Bulò, C. Snoek, O. Lanz, S. Messelodi, N. Sebe (eds), Springer, Cham, pp. 48-59, 2019. doi:10.1007/978-3-030-30642-7_5 (~56% overall acceptance rate) <i>* <u>indicates equal contribution</u></i>

[IC15]	N. Carissimi, P. Rota, C. Beyan , V. Murino, "Filling the Gaps: Predicting Missing Joints of Human Poses Using Denoising Autoencoders", In Proceedings of European Conference on Computer Vision (ECCV) Workshops, (9th International Workshop on Human Behavior Understanding), pp. 364-379, 2018. doi: 10.1007/978-3-030-11012-3_29.
[IC14]	C. Beyan , M. Shahid and V. Murino, "Investigation of Small Group Social Interactions Using Deep Visual Activity-Based Nonverbal Features", In Proceedings of 26 th ACM Multimedia (ACMMM), pp. 311-319, 2018. doi: 10.1145/3240508.3240685. (~27.5% overall acceptance rate)
[IC13]	N. Carissimi, C. Beyan , and V. Murino, "A Multi-View Learning Approach to Deception Detection", In Proceedings of 13 th IEEE International Conference on Automatic Face and Gesture Recognition (IEEE FG), pp. 599-606, 2018. doi: 10.1109/FG.2018.00095. (~47% overall acceptance rate)
[IC12]	C. Beyan , F. Capozzi, C. Becchio, and V. Murino, "Multi-task Learning of Social Psychology Assessments and Nonverbal Features for Automatic Leadership Identification", In Proceedings of ACM International Conference on Multimodal Interaction (ACM ICMI), pp. 451-455, 2017. doi: 10.1145/3136755.3136812. (~43% overall acceptance rate)
[IC11]	C. Beyan , V. M. Katsageorgiou, and V. Murino, "Moving as a Leader: Detecting Emergent Leadership in Small Groups using Body Pose", In Proceedings of 25 th ACM Multimedia (ACMMM), pp. 1425-1433, 2017. doi: 10.1145/3123266.3123404. (~28% overall acceptance rate)
[IC10]	C. Beyan , F. Capozzi, C. Becchio, and V. Murino, "Identification of Emergent Leaders in a Meeting Scenario Using Multiple Kernel Learning", In Proceedings of International Workshop on Advancements in Social Signal Processing for Multimodal Interaction (ASSP4MI), in conjunction with ACM International Conference on Multimodal Interaction (ACM ICMI), pp. 3-10, 2016. doi: 10.1145/3005467.3005469.
[IC09]	C. Beyan , N. Carissimi, F. Capozzi, S. Vascon, M. Bustreo, A. Pierro, C. Becchio, and V. Murino, "Detecting emergent leader in a meeting environment using nonverbal visual features only", In Proceedings of ACM International Conference on Multimodal Interaction (ACM ICMI), pp. 317-324, 2016. doi: 10.1145/2993148.2993175. (~38% overall acceptance rate)

[IC08]	<p>C. Beyan, R. B. Fisher, "Detection of Abnormal Fish Trajectories Using a Clustering Based Hierarchical Classifier", In Proceedings of British Machine Vision Conference (BMVC), pp. 1-11, 2013. doi: 10.5244/C.27.21. (~30% overall acceptance rate)</p>
[IC07]	<p>C. Beyan, R. B. Fisher, "Detecting abnormal fish trajectories using clustered and labeled data", In Proceedings of 20th IEEE International Conference on Image Processing (IEEE ICIP), pp. 1476-1480, 2013. doi: 10.1109/ICIP.2013.6738303. (~44.5% overall acceptance rate)</p>
[IC06]	<p>C. Beyan, R. B. Fisher, "A Filtering Mechanism for Normal Fish Trajectories", In Proceedings of the 21st International Conference on Pattern Recognition (ICPR), pp. 2286-2289, 2012. (~48.5% overall acceptance rate)</p>
[IC05]	<p>B. J. Boom, P. X. Huang, C. Beyan, C. Spampinato, S. Palazzo, J. He, E. Beauxis-Aussalet, S.-I. Lin, H.-M. Chou, G. Nadarajan, Y.-H. Chen-Burger, J. van Ossenbruggen, D. Giordano, L. Hardman, F.-P. Lin, R. B. Fisher, "Long-term underwater camera surveillance for monitoring and analysis of fish populations", International Workshop on Visual Observation and Analysis of Animal and Insect Behavior (VAIB), in conjunction with the 21st International Conference on Pattern Recognition, 2012.</p>
[IC04]	<p>S. Palazzo, C. Spampinato, C. Beyan, "Event Detection in Underwater Domain by Exploiting Fish Trajectory Clustering", In Proceedings of the 1st ACM international workshop on Multimedia analysis for ecological data (MAED), in conjunction with ACM Multimedia (ACMMM), pp. 31-36, 2012. doi: 10.1145/2390832.2390840.</p>
[IC03]	<p>C. Beyan, A. Temizel, "Mean-Shift Tracking for Surveillance Applications Using Thermal Infrared and Visible Band Data Fusion", In Proceedings of SPIE Vol. 8020, 802010, Defense, Security and Sensing: Airborne Intelligence, Surveillance, Reconnaissance (ISR) Systems and Applications VIII, pp. 1-13, 2011. doi: 10.1117/12.882838.</p>
[IC02]	<p>H. Ogul, C. Beyan, O. Eren, K. Yildiz, T. Ercelebi, B. Sonmez, "MicroRNA target recognition from compositional features of aligned microRNA-mRNA duplexes", In Proceedings of International Symposium on Innovations in Intelligent Systems and Applications (INISTA), 2010.</p>
[IC01]	<p>C. Beyan, H. Ogul, "A fuzzy k-NN approach for cancer diagnosis with</p>

	microarray gene expression data”, In Proceedings of 3rd International Symposium on Health Informatics and Bioinformatics (HIBIT), 2008.
--	---

Refereed National Conference Papers

[NC02]	Ç. Beyan , A. Temizel, “Detection of Abandoned Objects Using Thermal and Visible Band Tracking”, In Proceedings of 19th IEEE Conference on Signal Processing and Communications Applications (IEEE SIU), pp. 114-117, 2011. doi: 10.1109/SIU.2011.5929600. <i>(Received Alper Atalay Best Student Paper Award, first place)</i>
[NC01]	Ç. Beyan , A. Temizel, “A Hybrid Multi Object Tracker Using Mean-shift and Background Subtraction”, In Proceedings of 19th IEEE Conference on Signal Processing and Communications Applications (IEEE SIU), pp. 110-113, 2011. doi: 10.1109/SIU.2011.5929599.

TEACHING EXPERIENCE

Tutor/ Lab Demonstrator, Teaching Assistant and Marker at University of Edinburgh School of Informatics (September 2011- May 2015) Delivered:

- Advanced Vision (Marker, Guest Lecturer)
<http://www.inf.ed.ac.uk/teaching/courses/av/>
- Introductory Applied Machine Learning (Tutor)
<http://www.inf.ed.ac.uk/teaching/courses/iaml/>
- Database Systems (Tutor)
<http://homepages.inf.ed.ac.uk/libkin/teach/dbs13/>
- INF-1-DA: Informatics 1 - Data and Analysis (Tutor, Marker)
<http://www.inf.ed.ac.uk/teaching/courses/inf1/da/2013-2014/>
- INF-1-CP: Computer Programming: Skills and Concepts (Demonstrator, Teaching Assistant)
<http://www.inf.ed.ac.uk/teaching/courses/cp/>

Research/Teaching Assistant in Baskent University, Department of Computer Engineering (September 2008- September 2011) Delivered:

- BIL105 Programming Laboratory 1 (Programming with C)
- BIL106 Programming Laboratory 2 (Programming with C++)
- BIL231 Discrete Structures
- BIL240 Programming Languages

- BIL284 Assembly Languages
- BIL364 Automata Theory
- BIL352 Database Management Systems
- BIL431 Computer Networks
- BIL464 Multimedia Systems
- BIL375 Computer Organization and Architecture

SUPERVISION EXPERIENCE

- Nicolò Carissimi (PhD Thesis co-supervising, 2015-2019)
Investigating Social Interactions Using Multi-Modal Nonverbal Features
- Muhammad Shahid (PhD Thesis co-supervising, 2017-2021)
Social Interactions Analysis through Deep Visual Nonverbal Features
- Giancarlo Paoletti (PhD Thesis co-supervising, 2019-2023)
Unsupervised Social Interaction Analysis in-the-Wild

MEMBERSHIP

- **IEEE** (2013-current)
- **ACM** (2018-current)
- **The British Machine Vision Association (BMVA)** Student Membership (2013-2014)
- **Associate Fellow of the Higher Education Academy** (18/11/2014)