# Itır Önal Ertuğrul


**CONTACT INFORMATION**

Department of Cognitive Science and Artificial Intelligence
Tilburg University

+1 (412) 273 0053
itironal@gmail.com
itironal.github.io


**RESEARCH INTERESTS**

Machine learning, affective computing, multimodal interaction, biomedical signal processing, computer vision

**ACADEMIC AND WORK EXPERIENCE**

**Assistant Professor** **08/2020 - current**
Department of Cognitive Science and Artificial Intelligence, Tilburg University

**Postdoctoral Researcher** **02/2018 - 07/2020**
Robotics Institute, Carnegie Mellon University

**Postdoctoral Researcher** **09/2017 - 01/2018**
Affect Analysis Group, Department of Psychology, University of Pittsburgh

**Research and Teaching Assistant** **09/2011 - 09/2017**
ImageLab, Department of Computer Engineering, Middle East Technical University

**Visiting Ph.D. Student** **07/2016 - 09/2016**
Pattern Recognition and Bioinformatics Lab, Delft University of Technology

**Summer School Attendee** **07/2010 - 08/2010**
Microsoft Summer School, Ankara, Turkey

**Exchange Student** **02/2010 - 06/2010**
Department of Electrical Engineering, Czech Technical University

**Intern** **06/2009 - 07/2009**
Software Research and Development Center (SRDC), Ankara, Turkey

**Student Teaching Assistant** **09/2008 - 05/2011**
Department of Computer Engineering, Middle East Technical University

**EDUCATION**

**Middle East Technical University (METU)**, Ankara, Turkey

Ph.D., Computer Engineering, August 2017, 4.00/4.00

M.Sc., Computer Engineering, September 2013, 4.00/4.00

B.Sc., Computer Engineering, June 2011, 3.83/4.00 ($3^{rd}$ place)

**HONORS & AWARDS**

Best Paper Award in $12^{th}$ IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC) **2013**
High honor graduation, M.Sc. in Computer Engineering, METU **2013**
High honor graduation ($3^{rd}$ in ranking), B.Sc. Computer Engineering, METU **2011**
Outstanding Achievement Award, Computer Engineering, METU **2008 - 2011**
Ranked $1155^{th}$ among ~2M examinees in Turkish University Entrance Examination **2006**
Graduation with distinction ($3^{rd}$ in ranking), Ankara Atatürk Anatolian High School **2006**

## Research Grants

**Adaptive DBS in Non-Motor Neuropsychiatric Disorders: Regulating Limbic Circuit Imbalance.** **09/2016 - 06/2022**
National Institute of Neurological Disorders and Stroke
Role: Co-investigator

**Deep Brain Stimulation for Depression Using Directional Current Steering and Individualized Network Targeting.** **10/2017 - 09/2022**
National Institute of Neurological Disorders and Stroke
Role: Co-investigator

**Automatic Multimodal Affect Detection for Research and Clinical Use.** **08/2017 - 04/2022**
National Institutes of Mental Health
Role: Co-investigator

**Modeling the Dynamics of Early Communication and Development.** **08/2013 - 07/2018**
National Institute of General Medical Sciences
Role: Researcher

**Multi-layered cognitive learning model.** **09/2014 - 09/2016**
The Scientific and Technological Research Council of Turkey (TUBITAK) (Project no: 114E045)
Role: Researcher

**Local voxel networks for modeling and classification of brain activity during cognitive processing, using brain signals.** **09/2013 - 09/2015**
The Scientific and Technological Research Council of Turkey (TUBITAK) (Project no: 112E315)
Role: Researcher

**Havelsan Video Analysis System** **09/2011 - 09/2013**
Industry Theses Program (SAN-TEZ)
Role: Researcher

## Reviewing

IEEE Transactions on Affective Computing, IEEE Transactions on Pattern Analysis and Machine Intelligence, Neurocomputing, Image and Vision Computing, IEEE Journal of Biomedical and Health Informatics, IEEE Transactions on Cybernetics, Journal of Ambient Intelligence and Humanized Computing, IEEE International Conference on Automatic Face and Gesture Recognition, ACM Multimedia, International Conference on Pattern Recognition.

## Professional Activities

Co-organizer, Multimodal Interaction in Psychopathology Workshop (in conjunction with International Conference on Multimodal Interaction) **2020**
AI Program Committee Member, Grace Hopper Celebration **2020**

## Scholarships

**TUBITAK 2211: National Scholarship for Ph.D. Students** **2013 - 2017**
The Scientific and Technological Research Council of Turkey

**TUBITAK 2210: National Scholarship for M. Sc. Students** **2011 - 2013**
The Scientific and Technological Research Council of Turkey

## Certificates

Course Certificate of online course Probabilistic Graphical Models 2: Inference by Prof. Dr. Daphne Koller
Course Certificate of online course Probabilistic Graphical Models 1: Representation by Prof. Dr. Daphne Koller
Course Certificate of online course Machine Learning by Andrew Ng.

## TEACHING AND SUPERVISION

**Teaching Assistant**

- Computer Engineering Design **2013 - 2017**
- Introduction to C programming **2012 - 2014**
- Logic for Computer Science **2011 - 2015**
- Introduction to Bioinformatics **2014**
- Data Structures **2011**

**Students Advising**

- Yaohan Ding, Ph.D. student in School of Comp. and Inf., Uni. of Pittsburgh **2019**
- Le Yang, Visiting Ph.D. student, Northwestern Polytechnical University **2019**
- Bhavan Jasani, Master of Robotics, CMU **2018**
- Baran Baris Kivilcim, M.Sc. in Computer Engineering, METU **2018**
- Abdullah Alchihabi, M.Sc. in Computer Engineering, METU **2018**

## JOURNAL PUBLICATIONS

[1] **I. Onal Ertugrul**, J. F. Cohn, L. A. Jeni, Z. Zhang, L. Yin, and Q. Ji. Crossing domains for AU coding: perspectives, approaches, and measures. *IEEE Transactions on Biometrics, Behavior and Identity Science.* 2020.

[2] **I. Onal Ertugrul**, L. Yang, L. A. Jeni, J. F. Cohn. D-PAttNet: Dynamic Patch-Attentive Deep Network for Action Unit Detection. *Frontiers in Computer Science*, 2019.

[3] **I. Onal Ertugrul**, M. Ozay, F. T. Yarman Vural. Gender classification using mesh networks on multiresolution multitask fMRI data . *Brain Imaging and Behavior*, 2019.

[4] **I. Onal Ertugrul**, L. A. Jeni, H. Dibeklioglu. Modeling and Synthesis of Kinship Patterns of Facial Expressions. *Image and Vision Computing*, 2018.

[5] **I. Onal Ertugrul**, M. Ozay, F. T. Yarman Vural. Encoding the Local Connectivity Patterns of fMRI for Cognitive State Classification. *Brain Imaging and Behavior*, 2018.

[6] **I. Onal Ertugrul**, M. Ozay, F. T. Yarman Vural. Hierarchical Multi-resolution Mesh Networks for Brain Decoding *Brain Imaging and Behavior*, 2017.

[7] **I. Onal**, M. Ozay, E. Mizrak, I. Oztekin and F. T. Yarman Vural, A New Representation of fMRI Signal by a Set of Local Meshes for Brain Decoding. *IEEE Transactions on Signal and Information Processing over Networks*, 2017.

[8] O. Firat, M. Ozay, **I. Onal**, I. Oztekin, F. T. Yarman Vural, Enhancing Local Linear Models Using Functional Connectivity for Brain State Decoding, *International Journal of Cognitive Informatics and Natural Intelligence*, 2014.

## BOOK CHAPTERS

[9] J. F. Cohn, **I. Onal Ertugrul**, W. S. Chu, J. M. Girard, L. A. Jeni, and Z. Hammal. Affective facial computing: Generalizability across domains. In Multimodal Behavior Analysis in the Wild, pp. 407-441. Academic Press, 2019.

CONFERENCE PUBLICATIONS

[10] K. Niinuma, L. A. Jeni, **I. Onal Ertugrul**, and J. F. Cohn. Synthetic Expressions are Better Than Real for Learning to Detect Facial Actions. *IEEE Winter Conference on Applications of Computer Vision (WACV)* 2021.

[11] **I. Onal Ertugrul**, L. A. Jeni, and J. F. Cohn. PAttNet: Patch-attentive deep network for AU detection. *British Machine Vision Conference (BMVC)* 2019.

[12] K. Niinuma, L. A. Jeni, **I. Onal Ertugrul**, and J. F. Cohn. Unmasking the devil in the details: What works for deep facial action coding? *British Machine Vision Conference (BMVC)* 2019.

[13] L. Yang, **I. Onal Ertugrul**, J. F. Cohn, Z. Hammal, D. Jiang, and H. Sahli. FACS3D-Net: 3D convolution based spatiotemporal representation for action unit detection. *International Conference on Affective Computing and Intelligent Interaction (ACII)* 2019.

[14] **I. Onal Ertugrul**, J. F. Cohn, L. A. Jeni, Z. Zhang, L. Yin, and Q. Ji. Cross-domain AU detection: domains, learning approaches, and measures. *IEEE International Conference on Automatic Face and Gesture Recognition (FG)* 2019, (oral presentation).

[15] **I. Onal Ertugrul**, L. A. Jeni, W. Ding, and J. F. Cohn. AFAR: A Deep learning based tool for automated facial affect recognition. *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2019.

[16] J. F. Cohn, L. A. Jeni, **I. Onal Ertugrul**, D. Malone, M. S. Okun, D. Borton, and W. K. Goodman. Automated Affect Detection in Deep Brain Stimulation for Obsessive-Compulsive Disorder: A Pilot Study. *International Conference on Multimodal Interaction (ICMI)*, 2018.

[17] **I. Onal Ertugrul**, L. A. Jeni and J. F. Cohn, FACSCaps: Pose-Independent Facial Action Coding with Capsules *IEEE International Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2018.

[18] **I. Onal Ertugrul** and H. Dibeklioglu, What will Your Future Child Look Like? Modeling and Synthesis of Hereditary Patterns of Facial Dynamics. *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, 2017, (oral presentation).

[19] A. M. Ertugrul, **I. Onal**, C. Acarturk, Does the Strength of Sentiment Matter? A Regression Based Approach on Turkish Social Media, *International Conference on Applications of Natural Language to Information Systems (NLDB)*, 2017.

[20] A. Afrasiyabi, **I. Onal**, F. T. Yarman Vural, A Sparse Temporal Mesh Model for Brain Decoding, *15th IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC)*, 2016.

[21] **I. Onal**, M. Ozay, F. T. Yarman Vural, Functional Mesh Model with Temporal Measurements for Brain Decoding, $37^{th}$ *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2015.

[22] **I. Onal**, M. Ozay, F. T. Yarman Vural, Modeling Voxel Connectivity for Brain Decoding, *International Workshop on Pattern Recognition in Neuroimaging (PRNI)* 2015, (oral presentation)

[23] **I. Onal**, A. Temizel, F. T. Yarman Vural, Spatial and Temporal Feature Extraction for Brain Decoding using CUDA, *GPU Technology Conference (GTC)*, 2015.

[24] **I. Onal**, E. Aksan, B. Velioglu, O. Firat, M. Ozay, I. Oztekin, F. T. Yarman Vural, Modeling the Brain Connectivity for Pattern Analysis, $22^{nd}$ *International Conference on Pattern Recognition (ICPR)*, 2014

[25] O. Firat, **I. Onal**, E. Aksan, B. Velioglu, I. Oztekin, F. T. Yarman Vural, Large Scale Functional Connectivity For Brain Decoding, $11^{th}$ *IASTED International Conference on Biomedical Engineering (BioMed)*, 2014.

[26] B. Velioglu, E. Aksan, **I. Onal**, O. Firat, M. Ozay, F. T. Yarman Vural, Functional Networks of Anatomic Brain Regions, *13th IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC)*, 2014.

[27] **I. Onal**, A. M. Ertugrul, R. Cakici, Effect of Using Regression on Class Confidence Scores in Sentiment Analysis of Twitter Data, *5th ACL Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis (WASSA)*, 2014.

[28] A. M. Ertugrul, **I. Onal**, RemindMe: An Enhanced Mobile Location-Based Reminder Application, *International Conference on Future Internet of Things and Cloud (FiCloud)*, 2014.

[29] **I. Onal**, M. Ozay, O. Firat, I. Oztekin, F. T. Yarman Vural, An Information Theoretic Approach to Classify Cognitive States Using fMRI, $13^{th}$ *IEEE International Conference on BioInformatics and BioEngineering (BIBE)*, 2013.

[30] **I. Onal**, M. Ozay, O. Firat, I. Oztekin, F. T. Yarman Vural, Analyzing the Information Distribution in the fMRI measurements by estimating the degree of locality, $35^{th}$ *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2013.

[31] O. Firat, M. Ozay, **I. Onal**, I. Oztekin, F. T. Yarman Vural, Functional Mesh Learning for Pattern Analysis of Cognitive Processes, $12th$ *IEEE International Conference on Cognitive Informatics and Cognitive Computing (ICCI*CC)*, 2013. **(Best Paper Award)**

[32] O. Firat, M. Ozay, *I. Onal*, I. Oztekin, F. T. Yarman Vural, Representation of Cognitive Processes Using the Minimum Spanning Tree of Local Meshes, $35^{th}$ *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2013.

[33] **I. Onal**, K. Kardas, Y. Rezaeitabar, U. Bayram, M. Bal, I. Ulusoy, N. Kesim Cicekli, A framework for Detecting Complex Events in Surveillance Videos, *3rd IEEE International Workshop on Advances in Automated Multimedia Surveillance for Public Safety (AAMS-PS)*, 2013.

NATIONAL CONFERENCE PUBLICATIONS

[34] A. Afrasiyabi, **I. Onal**, F. T. Yarman Vural. Effect of voxel selection on temporal mesh model for brain decoding. $24^{th}$ *IEEE Signal Processing and Communication Application Conference (SIU)*, 2016. (in Turkish)

[35] **I. Onal**, E. Aksan, B. Velioglu, O. Firat, M. Ozay, I. Oztekin, F. T. Yarman Vural, A Brain Network for Cognitive State Analysis. $23^{rd}$ *IEEE Conference on Signal Processing and Communications Applications (SIU)*, 2015. (in Turkish)

[36] **I. Onal**, E. Aksan, B. Velioglu, O. Firat, M. Ozay, I. Oztekin, F. T. Yarman Vural, Estimating Brain Connectivity for Pattern Analysis, $22^{nd}$ *IEEE Conference on Signal Processing and Communications Applications (SIU)*, 2014. (in Turkish)

[37] **I. Onal**, A. M. Ertugrul, Effect of Using Regression in Sentiment Analysis, $22^{nd}$ *IEEE Conference on Signal Processing and Communications Applications (SIU)*, 2014. (in Turkish)

[38] A. M. Ertugrul, **I. Onal**, Çeşitli Konum Etiketleme Opsiyonlarıyla Zenginleştirilmiş Yeni Bir Konum Bazlı Hatırlatma Uygulaması, *8. Ulusal Yazılım Mühendisliği Sempozyumu (UYMS)*, 2014. (in Turkish)

[39] **I. Onal**, M. Ozay, O. Firat, I. Oztekin, F. T. Yarman Vural, Information Distribution Analysis in the fMRI measurements with Degree of Locality Estimation, $21^{th}$ *IEEE Conference on Signal Processing and Communications Applications (SIU), 2013* (in Turkish)

[40] O. Firat, M. Ozay, **I. Onal**, I. Oztekin, F. T. Yarman Vural, Cognitive Processes Representation Using Minimum Spanning Tree of Local Meshes, $21^{th}$ *IEEE Conference on Signal Processing and Communications Applications (SIU), 2013* (in Turkish)

[41] O. Firat, M. Ozay, **I. Onal**, I. Oztekin, F. T. Yarman Vural, A Mesh Learning Approach for Brain Data Modeling, $20^{th}$ *IEEE Conference on Signal Processing and Communications Applications (SIU)*, 2012. (in Turkish)

THESES

[42] **I. Onal Ertugrul**, Representation of Human Brain by Mesh Networks. *Ph.D. Thesis, Middle East Technical University, Department of Computer Engineering*, 2017.

[43] **I. Onal**, An Information Theoretic Representation of Brain Connectivity for Cognitive State Classification Using Functional Magnetic Resonance Imaging. *M.Sc. Thesis, Middle East Technical University, Department of Computer Engineering*, 2013.