

Asst. Prof. ELİF VURAL

Personal Information

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Education Information

Doctorate, Ecole Polytechnique Fédérale De Lausanne, Epfl (The Federal Institute Of Technology, Lausanne), Mühendislik Fakültesi, Elektrik Ve Elektronik Mühendisliği Bölümü, Switzerland 2008 - 2013

Post Graduate, Middle East Technical University, Graduate School of Natural and Applied Sciences, Elektrik Ve Elektronik Mühendisliği Bölümü, Turkey 2006 - 2008

Undergraduate Double Major, Middle East Technical University, Fen Edebiyat Fakültesi , Matematik, Turkey 2003 - 2006

Under Graduate, Middle East Technical University, Faculty of Engineering, Department of Electrical and Electronics Engineering, Turkey 2002 - 2006

Dissertations

Doctorate, Transformation-Invariant Analysis of Visual Signals with Parametric Models, Ecole Polytechnique Federale De Lausanne, 2013

Post Graduate, Robust extraction of sparse 3D points from image sequences, Middle East Technical University, Graduate School of Natural and Applied Sciences, 2008

Research Areas

Electrical and Electronics Engineering

Academic Titles / Tasks

Assistant Professor, Middle East Technical University, Faculty of Engineering, Department of Electrical and Electronics Engineering, 2015 - Continues

Courses

Engineering Design I, Under Graduate, 2015 - 2016, 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020, 2020 - 2021

Signals and Systems 1, Under Graduate, 2019 - 2020, 2020 - 2021

ENGINEERING DESIGN II, Under Graduate, 2015 - 2016, 2016 - 2017, 2017 - 2018, 2018 - 2019, 2019 - 2020

Signals and Systems II, Under Graduate, 2019 - 2020

Seminar, Post Graduate, 2018 - 2019

Graduate Seminars, Doctorate, 2018 - 2019

Probability and Stochastic Processes, Post Graduate, 2015 - 2016, 2016 - 2017, 2017 - 2018

Advising Theses

- Vural E., Multi-modal learning with generalizable nonlinear dimensionality reduction, Post Graduate, S.KAYA(Student), 2019
- VURAL E., Domain adaptation on graphs by learning aligned graph bases, Post Graduate, M.PİLANCI(Student), 2018
- VURAL E., Nonlinear supervised dimensionality reduction via smooth regular embeddings, Post Graduate, C.ÖRNEK(Student), 2018
- VURAL E., Dictionary learning for efficient classification with 1-sparse representations, Post Graduate, E.ENGİN(Student), 2018
- VURAL E., ALATAN A. A. , Spectral graph based approach for analysis of 3D LIDAR point clouds, Post Graduate, E.BAYRAM(Student), 2017
- VURAL E., Clustering of manifold-modeled data based on tangent space variations, Post Graduate, G.GÖKDÖĞAN(Student), 2017
- VURAL E., DIM POINT TARGET TRACKING IN INFRARED IMAGE SEQUENCES WITH LOW SNR, Post Graduate, Z.SELİN(Student), 2016

Articles Published in Journals That Entered SCI, SSCI and AHCI Indexes

- I. **Domain Adaptation on Graphs by Learning Aligned Graph Bases**
Pilancı M., Vural E.
IEEE Transactions On Knowledge And Data Engineering, vol.0, pp.1-14, 2020 (Journal Indexed in SCI Expanded)
- II. **Mask Combination of Multi-Layer Graphs for Global Structure Inference**
Bayram E., Thanou D., VURAL E., Frossard P.
IEEE TRANSACTIONS ON SIGNAL AND INFORMATION PROCESSING OVER NETWORKS, vol.6, pp.394-406, 2020 (Journal Indexed in SCI)
- III. **Nonlinear supervised dimensionality reduction via smooth regular embeddings**
Ornek C., VURAL E.
PATTERN RECOGNITION, vol.87, pp.55-66, 2019 (Journal Indexed in SCI)
- IV. **Domain adaptation on graphs by learning graph topologies: theoretical analysis and an algorithm**
Vural E.
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, vol.27, no.3, pp.1619-1635, 2019 (Journal Indexed in SCI)
- V. **Analysis of Airborne LiDAR Point Clouds With Spectral Graph Filtering**
Bayram E., Frossard P., Vural E., Alatan A. A.
IEEE GEOSCIENCE AND REMOTE SENSING LETTERS, vol.15, pp.1284-1288, 2018 (Journal Indexed in SCI)
- VI. **A Study of the Classification of Low-Dimensional Data with Supervised Manifold Learning**
VURAL E., Guillemot C.
JOURNAL OF MACHINE LEARNING RESEARCH, vol.18, pp.1-55, 2018 (Journal Indexed in SCI)
- VII. **Out-of-Sample Generalizations for Supervised Manifold Learning for Classification**
VURAL E., Guillemot C.
IEEE TRANSACTIONS ON IMAGE PROCESSING, vol.25, no.3, pp.1410-1424, 2016 (Journal Indexed in SCI)
- VIII. **Geometry-Aware Neighborhood Search for Learning Local Models for Image Superresolution**
Ferreira J. C. , VURAL E., Guillemot C.
IEEE TRANSACTIONS ON IMAGE PROCESSING, vol.25, no.3, pp.1354-1367, 2016 (Journal Indexed in SCI)
- IX. **Analysis of Image Registration with Tangent Distance**
Vural E., Frossard P.
SIAM JOURNAL ON IMAGING SCIENCES, vol.7, no.4, pp.2860-2915, 2014 (Journal Indexed in SCI)
- X. **Learning Smooth Pattern Transformation Manifolds**
Vural E., Frossard P.
IEEE TRANSACTIONS ON IMAGE PROCESSING, vol.22, no.4, pp.1311-1325, 2013 (Journal Indexed in SCI)

- XI. **Analysis of Descent-Based Image Registration**
Vural E., Frossard P.
SIAM JOURNAL ON IMAGING SCIENCES, vol.6, no.4, pp.2310-2349, 2013 (Journal Indexed in SCI)
- XII. **Discretization of Parametrizable Signal Manifolds**
Vural E., Frossard P.
IEEE TRANSACTIONS ON IMAGE PROCESSING, vol.20, no.12, pp.3621-3633, 2011 (Journal Indexed in SCI)

Articles Published in Other Journals

- I. **Tangent space estimation for smooth embeddings of Riemannian manifolds**
Tyagi H., VURAL E., Frossard P.
Information and Inference: A Journal of the IMA, vol.2, pp.69-114, 2013 (Refereed Journals of Other Institutions)

Refereed Congress / Symposium Publications in Proceedings

- I. **A Theoretical Analysis of Multi-Modal Representation Learning with Regular Functions**
Vural E.
2020 28th Signal Processing and Communications Applications Conference (SIU), Gaziantep, Turkey, 5 - 07 October 2020, pp.1-4
- II. **Investigation of Stationarity for Graph Time Series Data Sets**
Güneyi E. T. , Vural E.
2020 28th Signal Processing and Communications Applications Conference (SIU), 5 - 07 October 2020, pp.1-4
- III. **Multi-Modal Learning With Generalizable Nonlinear Dimensionality Reduction**
KAYA S., VURAL E.
2019 IEEE International Conference on Image Processing (ICIP), Taipei, Taiwan, 22 - 25 September 2019, pp.2139-2143
- IV. **Domain Adaptation with Nonparametric Projections**
Vural E.
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey, 24 - 26 April 2019, pp.1-4
- V. **Domain Adaptation on Graphs via Frequency Analysis**
Pilancı M., Vural E.
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey, 24 - 26 April 2019, pp.1-4
- VI. **Cross-modal Representation Learning with Nonlinear Dimensionality Reduction**
Kaya S., Vural E.
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Turkey, 24 - 26 April 2019, pp.1-4
- VII. **Learning Semi-Supervised Nonlinear Embeddings for Domain-Adaptive Pattern Recognition**
VURAL E.
International Conference on Advanced Technologies, Computer Engineering and Science (ICATCES 2019), Antalya, Alanya, Turkey, 26 - 28 April 2019, pp.295-299
- VIII. **GENERALIZATION BOUNDS FOR DOMAIN ADAPTATION VIA DOMAIN TRANSFORMATIONS**
VURAL E.
IEEE 28th International Workshop on Machine Learning for Signal Processing (MLSP), Aalborg, Denmark, 17 - 20 September 2018
- IX. **GENERALIZABLE SUPERVISED MANIFOLD LEARNING VIA LIPSCHITZ CONTINUOUS INTERPOLATORS**
Ornek C., VURAL E.
IEEE 28th International Workshop on Machine Learning for Signal Processing (MLSP), Aalborg, Denmark, 17 - 20

September 2018

- X. **PROGRESSIVE CLUSTERING OF MANIFOLD-MODELED DATA BASED ON TANGENT SPACE VARIATIONS**
Gokdogan G., VURAL E.
27th IEEE International Workshop on Machine Learning for Signal Processing (MLSP), Tokyo, Japan, 25 - 28
September 2017
- XI. **A Graph Signal Filtering Based Approach for Detection of Different Edge Types on Airborne LiDAR Data**
Bayram E., Vural E., Alatan A. A.
Conference on Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing XIII,
Warszawa, Poland, 11 - 12 September 2017, vol.10429
- XII. **DOMAIN ADAPTATION VIA TRANSFERRING SPECTRAL PROPERTIES OF LABEL FUNCTIONS ON GRAPHS**
Pilanci M., VURAL E.
12th IEEE Image, Video, and Multidimensional Signal Processing Workshop (IVMSP), Bordeaux, France, 11 - 12
July 2016
- XIII. **A performance study of the tangent distance method in transformation-invariant image classification**
VURAL E., Frossard P.
2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), South Brisbane,
Queensland, Australia, Australia, 19 - 24 April 2015, pp.5773-5777
- XIV. **TRANSFORMATION-INVARIANT DICTIONARY LEARNING FOR CLASSIFICATION WITH 1-SPARSE REPRESENTATIONS**
Yuzuguler A. C. , Vural E., Frossard P.
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Florence, Italy, 4 - 09 May
2014
- XV. **Analysis of Hierarchical Image Alignment with Descent Methods**
Vural E., Frossard P.
10th International Conference on Sampling Theory and Applications, Bremen, Germany, 1 - 05 July 2013
- XVI. **Tangent Space Estimation Bounds for Smooth Manifolds**
Tyagi H., Vural E., Frossard P.
10th International Conference on Sampling Theory and Applications, Bremen, Germany, 1 - 05 July 2013
- XVII. **Learning pattern transformation manifolds for classification**
VURAL E., Frossard P.
2012 19th IEEE International Conference on Image Processing, Orlando, FL, USA, United States Of America, 30
September - 03 October 2012, pp.1165-1168
- XVIII. **Alignment of uncalibrated images for multi-view classification**
Arik S. Ö. , VURAL E., Frossard P.
2011 18th IEEE International Conference on Image Processing, Brussels, Belgium, Belgium, 11 - 14 September
2011, pp.2365-2368
- XIX. **Approximation of pattern transformation manifolds with parametric dictionaries**
VURAL E., Frossard P.
2011 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Prague, Czech Republic,
Czech Republic, 22 - 27 May 2011, pp.977-980
- XX. **Learning Pattern Transformation Manifolds with Parametric Atom Selection**
Vural E., Frossard P.
9th International Conference on Sampling Theory and Applications, Singapore, Singapore, 2 - 06 May 2011
- XXI. **Curvature analysis of pattern transformation manifolds**
VURAL E., Frossard P.
2010 IEEE International Conference on Image Processing, Hong Kong, Hong Kong, Hong Kong, 26 - 29 September
2010, pp.2689-2692
- XXII. **Distance-based discretization of parametric signal manifolds**
VURAL E., Frossard P.

2010 IEEE International Conference on Acoustics, Speech and Signal Processing, Dallas, TX, USA, United States Of America, 14 - 19 March 2010, pp.3574-3577

XXIII. Outlier removal for sparse 3D reconstruction from video

VURAL E., ALATAN A. A.

3DTV Conference - True Vision - Capture, Transmission and Display of 3D Video, İstanbul, Turkey, 28 - 30 May 2008, pp.321-324

Supported Projects

Vural E., TUBITAK Project, Zamanda Değişen Graf Sinyallerinin Eksik Gözlemlerden Kestirimi, 2021 - 2023

Vural E., Öktem S. F. , TUBITAK Project, Düşük Boyutlu Veri Kümeleri için Grafa Dayalı Transfer Öğrenme, 2017 - 2018

Scientific Refereeing

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, May 2020

NEURAL NETWORKS, Journal Indexed in SCI-E, May 2020

IEEE ACCESS, Journal Indexed in SCI-E, May 2020

IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING, Journal Indexed in SCI-E, April 2020

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, March 2020

JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS, Journal Indexed in SCI-E, February 2020

INFORMATION FUSION, Journal Indexed in SCI-E, December 2019

IEEE TRANSACTIONS ON CYBERNETICS, Journal Indexed in SCI-E, December 2019

IEEE Access, Journal Indexed in SCI-E, November 2019

IEEE TRANSACTIONS ON CYBERNETICS, Journal Indexed in SCI-E, November 2019

IEEE TRANSACTIONS ON SIGNAL AND INFORMATION PROCESSING OVER NETWORKS, Journal Indexed in SCI-E, September 2019

IEEE TRANSACTIONS ON CYBERNETICS, Journal Indexed in SCI-E, September 2019

PATTERN RECOGNITION, Journal Indexed in SCI-E, May 2019

PATTERN RECOGNITION, Journal Indexed in SCI-E, April 2019

IEEE TRANSACTIONS ON CYBERNETICS, Journal Indexed in SCI-E, April 2019

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI Journal, December 2018

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI Journal, December 2018

NEURAL PROCESSING LETTERS, SCI Journal, November 2018

JOURNAL OF ELECTRONIC IMAGING, SCI Journal, February 2018

DIGITAL SIGNAL PROCESSING, Journal Indexed in SCI-E, December 2017

DIGITAL SIGNAL PROCESSING, Journal Indexed in SCI-E, July 2016

IEEE SIGNAL PROCESSING LETTERS, Journal Indexed in SCI-E, March 2016

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, February 2015

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, January 2015

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, November 2014

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, September 2013

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, September 2013

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, September 2012

IEEE TRANSACTIONS ON IMAGE PROCESSING, Journal Indexed in SCI-E, February 2012

Citations

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