

## Doç. Dr. ELİF VURAL

### Kişisel Bilgiler

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### Uluslararası Araştırmacı ID'leri

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Publons / Web Of Science ResearcherID: AAZ-9275-2020

ScopusID: 26645193800

Yoksis Araştırmacı ID: 235293

### Eğitim Bilgileri

Doktora, Ecole Polytechnique Fédérale de Lausanne, EPFL (The Federal Institute of Technology, Lausanne), Mühendislik Fakültesi, Elektrik Ve Elektronik Mühendisliği Bölümü, İsviçre 2008 - 2013

Yüksek Lisans, Orta Doğu Teknik Üniversitesi, Fen Bilimleri Enstitüsü, Elektrik Ve Elektronik Mühendisliği Bölümü, Türkiye 2006 - 2008

Lisans Çift Anadal, Orta Doğu Teknik Üniversitesi, Fen Edebiyat Fakültesi , Matematik, Türkiye 2003 - 2006

Lisans, Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Elektrik ve Elektronik Mühendisliği Bölümü, Türkiye 2002 - 2006

### Yaptığı Tezler

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

Yüksek Lisans, Robust extraction of sparse 3D points from image sequences, Orta Doğu Teknik Üniversitesi, Fen Bilimleri Enstitüsü, 2008

### Araştırma Alanları

Elektrik-Elektronik Mühendisliği

### Akademik Unvanlar / Görevler

Dr. Öğr. Üyesi, Orta Doğu Teknik Üniversitesi, Mühendislik Fakültesi, Elektrik ve Elektronik Mühendisliği Bölümü, 2015 - Devam Ediyor

### Verdiği Dersler

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

Signals and Systems 1, Lisans, 2020 - 2021, 2019 - 2020

ENGINEERING DESIGN II, Lisans, 2019 - 2020, 2018 - 2019, 2017 - 2018, 2016 - 2017, 2015 - 2016

Signals and Systems II, Lisans, 2019 - 2020

Seminar, Yüksek Lisans, 2018 - 2019

Graduate Seminars, Doktora, 2018 - 2019

Probability and Stochastic Processes, Yüksek Lisans, 2017 - 2018, 2016 - 2017, 2015 - 2016

## Yönetilen Tezler

Vural E., JOINT LEARNING OF GRAPH PROCESSES AND GRAPH TOPOLOGIES FOR TIME VERTEX SIGNAL ESTIMATION, Yüksek Lisans, B.YALDIZ(Öğrenci), 2024

Yılmaz A. Ö., Vural E., REPRESENTATION LEARNING BASED DOWNLINK CHANNEL COVARIANCE MATRIX ESTIMATION FOR FDD MASSIVE MIMO, Yüksek Lisans, M.CAN(Öğrenci), 2024

Vural E., Estimation of partially observed graph signals by learning spectrally matched graph dictionaries, Yüksek Lisans, O.FURKAN(Öğrenci), 2023

Vural E., Locally stationary graph processes, Yüksek Lisans, A.CANBOLAT(Öğrenci), 2023

VURAL E., Estimation of time varying graph signals with graph arma processes, Yüksek Lisans, E.TUĞÇE(Öğrenci), 2021

Vural E., ESTIMATION OF PARTIALLY OBSERVED MULTIPLE GRAPH SIGNALS BY LEARNING SPECTRALLY CONCENTRATED GRAPH KERNELS, Yüksek Lisans, G.TURHAN(Öğrenci), 2021

Vural E., Multi-modal learning with generalizable nonlinear dimensionality reduction, Yüksek Lisans, S.KAYA(Öğrenci), 2019

VURAL E., Dictionary learning for efficient classification with 1-sparse representations, Yüksek Lisans, E.ENGİN(Öğrenci), 2018

VURAL E., Nonlinear supervised dimensionality reduction via smooth regular embeddings, Yüksek Lisans, C.ÖRNEK(Öğrenci), 2018

VURAL E., Domain adaptation on graphs by learning aligned graph bases, Yüksek Lisans, M.PİLANCI(Öğrenci), 2018

VURAL E., Clustering of manifold-modeled data based on tangent space variations, Yüksek Lisans, G.GÖKDOĞAN(Öğrenci), 2017

ALATAN A. A., VURAL E., Spectral graph based approach for analysis of 3D LIDAR point clouds, Yüksek Lisans, E.BAYRAM(Öğrenci), 2017

VURAL E., DIM POINT TARGET TRACKING IN INFRARED IMAGE SEQUENCES WITH LOW SNR, Yüksek Lisans, Z.SELİN(Öğrenci), 2016

## SCI, SSCI ve AHCI İndekslerine Giren Dergilerde Yayımlanan Makaleler

- I. **Graph domain adaptation with localized graph signal representations**  
Pilavcı Y. Y., Güneyi E. T., Cengiz C., VURAL E.  
Pattern Recognition, cilt.155, 2024 (SCI-Expanded)
- II. **Learning Graph ARMA Processes From Time-Vertex Spectra**  
Güneyi E. T., Yaldiz B., CANBOLAT A., VURAL E.  
IEEE Transactions on Signal Processing, cilt.72, ss.47-56, 2024 (SCI-Expanded)
- III. **Locally Stationary Graph Processes**  
CANBOLAT A., VURAL E.  
IEEE Transactions on Signal Processing, cilt.72, ss.2323-2332, 2024 (SCI-Expanded)
- IV. **Domain Adaptation on Graphs by Learning Aligned Graph Bases**  
Pilanci M., VURAL E.  
IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING, cilt.34, sa.2, ss.587-600, 2022 (SCI-Expanded)
- V. **Learning Multi-Modal Nonlinear Embeddings: Performance Bounds and an Algorithm**  
Kaya S., VURAL E.  
IEEE TRANSACTIONS ON IMAGE PROCESSING, cilt.30, ss.4384-4394, 2021 (SCI-Expanded)

- VI. **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, cilt.6, ss.394-406, 2020 (SCI-Expanded)
- VII. **Nonlinear supervised dimensionality reduction via smooth regular embeddings**  
Ornek C., VURAL E.  
PATTERN RECOGNITION, cilt.87, ss.55-66, 2019 (SCI-Expanded)
- VIII. **Domain adaptation on graphs by learning graph topologies: theoretical analysis and an algorithm**  
Vural E.  
TURKISH JOURNAL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCES, cilt.27, sa.3, ss.1619-1635, 2019 (SCI-Expanded)
- IX. **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, cilt.15, ss.1284-1288, 2018 (SCI-Expanded)
- X. **A Study of the Classification of Low-Dimensional Data with Supervised Manifold Learning**  
VURAL E., Guillemot C.  
JOURNAL OF MACHINE LEARNING RESEARCH, cilt.18, ss.1-55, 2018 (SCI-Expanded)
- XI. **Out-of-Sample Generalizations for Supervised Manifold Learning for Classification**  
VURAL E., Guillemot C.  
IEEE TRANSACTIONS ON IMAGE PROCESSING, cilt.25, sa.3, ss.1410-1424, 2016 (SCI-Expanded)
- XII. **Geometry-Aware Neighborhood Search for Learning Local Models for Image Superresolution**  
Ferreira J. C., VURAL E., Guillemot C.  
IEEE TRANSACTIONS ON IMAGE PROCESSING, cilt.25, sa.3, ss.1354-1367, 2016 (SCI-Expanded)
- XIII. **Analysis of Image Registration with Tangent Distance**  
Vural E., Frossard P.  
SIAM JOURNAL ON IMAGING SCIENCES, cilt.7, sa.4, ss.2860-2915, 2014 (SCI-Expanded)
- XIV. **Learning Smooth Pattern Transformation Manifolds**  
Vural E., Frossard P.  
IEEE TRANSACTIONS ON IMAGE PROCESSING, cilt.22, sa.4, ss.1311-1325, 2013 (SCI-Expanded)
- XV. **Analysis of Descent-Based Image Registration**  
Vural E., Frossard P.  
SIAM JOURNAL ON IMAGING SCIENCES, cilt.6, sa.4, ss.2310-2349, 2013 (SCI-Expanded)
- XVI. **Discretization of Parametrizable Signal Manifolds**  
Vural E., Frossard P.  
IEEE TRANSACTIONS ON IMAGE PROCESSING, cilt.20, sa.12, ss.3621-3633, 2011 (SCI-Expanded)

## **Diğer Dergilerde Yayınlanan Makaleler**

- I. **Tangent space estimation for smooth embeddings of Riemannian manifolds**  
Tyagi H., VURAL E., Frossard P.  
Information and Inference: A Journal of the IMA, cilt.2, ss.69-114, 2013 (Hakemli Dergi)

## **Hakemli Kongre / Sempozyum Bildiri Kitaplarında Yer Alan Yayınlar**

- I. **An Efficient Algorithm for Learning Locally Stationary Graph Processes**  
Canbolat A., VURAL E.  
32nd European Signal Processing Conference, EUSIPCO 2024, Lyon, Fransa, 26 - 30 Ağustos 2024, ss.2312-2316
- II. **An Experimental Study of the Sample Complexity of Domain Adaptation Alan Uyarlamada Örnek Karmaşıklığının Deneysel İncelemesi**

Karaca H., Akgül Ö., Arslan Ö. F., Aydemir A. C., Aydın F. S., Ünsal E. A., Vural E.

31st IEEE Conference on Signal Processing and Communications Applications, SIU 2023, İstanbul, Türkiye, 5 - 08 Temmuz 2023

- III. **Learning Time-Vertex Dictionaries for Estimating Time-Varying Graph Signals**  
Acar A. B., VURAL E.  
32nd IEEE International Workshop on Machine Learning for Signal Processing, MLSP 2022, Xian, Çin, 22 - 25 Ağustos 2022, cilt.2022-August
- IV. **Estimation of Locally Stationary Graph Processes from Incomplete Realizations**  
CANBOLAT A., VURAL E.  
32nd IEEE International Workshop on Machine Learning for Signal Processing, MLSP 2022, Xian, Çin, 22 - 25 Ağustos 2022, cilt.2022-August
- V. **Estimation of Time-Varying Graph Signals by Learning Graph Dictionaries Zamanda Değişen Graf Sinyallerinin Kestirimi için Graflarda Sözlük Öğrenme**  
Acar A. B., VURAL E.  
30th Signal Processing and Communications Applications Conference, SIU 2022, Safranbolu, Türkiye, 15 - 18 Mayıs 2022
- VI. **Learning Graph Signal Representations with Narrowband Spectral Kernels**  
Kar O. F., Turhan G., VURAL E.  
32nd IEEE International Workshop on Machine Learning for Signal Processing, MLSP 2022, Xian, Çin, 22 - 25 Ağustos 2022, cilt.2022-August
- VII. **Learning Narrowband Graph Spectral Kernels for Graph Signal Estimation Çizge Sinyallerinin Dar Bantlı Spektral Kernel Öğrenimi ile Kestirimi**  
Furkan Kar O., Turhan G., VURAL E.  
30th Signal Processing and Communications Applications Conference, SIU 2022, Safranbolu, Türkiye, 15 - 18 Mayıs 2022
- VIII. **A Theoretical Analysis of Multi-Modal Representation Learning with Regular Functions**  
Vural E.  
2020 28th Signal Processing and Communications Applications Conference (SIU), Gaziantep, Türkiye, 5 - 07 Ekim 2020, ss.1-4
- IX. **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 Ekim 2020, ss.1-4
- X. **Learning Parametric Time-Vertex Graph Processes from Incomplete Realizations**  
Guneyi E. T., CANBOLAT A., VURAL E.  
31st IEEE International Workshop on Machine Learning for Signal Processing, MLSP 2021, Gold-Coast, Avustralya, 25 - 28 Ekim 2021, cilt.2021-October
- XI. **Estimating Partially Observed Graph Signals by Learning Spectrally Concentrated Graph Kernels**  
Turhan G., VURAL E.  
31st IEEE International Workshop on Machine Learning for Signal Processing, MLSP 2021, Gold-Coast, Avustralya, 25 - 28 Ekim 2021, cilt.2021-October
- XII. **Multi-Modal Learning With Generalizable Nonlinear Dimensionality Reduction**  
KAYA S., VURAL E.  
2019 IEEE International Conference on Image Processing (ICIP), Taipei, Tayvan, 22 - 25 Eylül 2019, ss.2139-2143
- XIII. **Domain Adaptation with Nonparametric Projections**  
Vural E.  
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Türkiye, 24 - 26 Nisan 2019, ss.1-4
- XIV. **Cross-modal Representation Learning with Nonlinear Dimensionality Reduction**  
Kaya S., Vural E.  
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Türkiye, 24 - 26 Nisan 2019, ss.1-4

- XV. **Domain Adaptation on Graphs via Frequency Analysis**  
Pilancı M., Vural E.  
2019 27th Signal Processing and Communications Applications Conference (SIU), Sivas, Türkiye, 24 - 26 Nisan 2019, ss.1-4
- XVI. **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, Türkiye, 26 - 28 Nisan 2019, ss.295-299
- XVII. **GENERALIZATION BOUNDS FOR DOMAIN ADAPTATION VIA DOMAIN TRANSFORMATIONS**  
VURAL E.  
IEEE 28th International Workshop on Machine Learning for Signal Processing (MLSP), Aalborg, Danimarka, 17 - 20 Eylül 2018
- XVIII. **GENERALIZABLE SUPERVISED MANIFOLD LEARNING VIA LIPSCHITZ CONTINUOUS INTERPOLATORS**  
Ornek C., VURAL E.  
IEEE 28th International Workshop on Machine Learning for Signal Processing (MLSP), Aalborg, Danimarka, 17 - 20 Eylül 2018
- XIX. **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, Japonya, 25 - 28 Eylül 2017
- XX. **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, Polonya, 11 - 12 Eylül 2017, cilt.10429
- XXI. **DOMAIN ADAPTATION VIA TRANSFERRING SPECTRAL PROPERTIES OF LABEL FUNCTIONS ON GRAPHS**  
Pilancı M., VURAL E.  
12th IEEE Image, Video, and Multidimensional Signal Processing Workshop (IVMSP), Bordeaux, Fransa, 11 - 12 Temmuz 2016
- XXII. **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, Avustralya, 19 - 24 Nisan 2015, ss.5773-5777
- XXIII. **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, İtalya, 4 - 09 Mayıs 2014
- XXIV. **Analysis of Hierarchical Image Alignment with Descent Methods**  
Vural E., Frossard P.  
10th International Conference on Sampling Theory and Applications, Bremen, Almanya, 1 - 05 Temmuz 2013
- XXV. **Tangent Space Estimation Bounds for Smooth Manifolds**  
Tyagi H., Vural E., Frossard P.  
10th International Conference on Sampling Theory and Applications, Bremen, Almanya, 1 - 05 Temmuz 2013
- XXVI. **Learning pattern transformation manifolds for classification**  
VURAL E., Frossard P.  
2012 19th IEEE International Conference on Image Processing, Orlando, FL, USA, Amerika Birleşik Devletleri, 30 Eylül - 03 Ekim 2012, ss.1165-1168
- XXVII. **Alignment of uncalibrated images for multi-view classification**  
Arık S. Ö., VURAL E., Frossard P.

2011 18th IEEE International Conference on Image Processing, Brussels, Belgium, Belçika, 11 - 14 Eylül 2011, ss.2365-2368

**XXVIII. 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, Çek Cumhuriyeti, 22 - 27 Mayıs 2011, ss.977-980

**XXIX. Learning Pattern Transformation Manifolds with Parametric Atom Selection**

Vural E., Frossard P.

9th International Conference on Sampling Theory and Applications, Singapore, Singapur, 2 - 06 Mayıs 2011

**XXX. 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 Eylül 2010, ss.2689-2692

**XXXI. Distance-based discretization of parametric signal manifolds**

VURAL E., Frossard P.

2010 IEEE International Conference on Acoustics, Speech and Signal Processing, Dallas, TX, USA, Amerika Birleşik Devletleri, 14 - 19 Mart 2010, ss.3574-3577

**XXXII. 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, Türkiye, 28 - 30 Mayıs 2008, ss.321-324

## Desteklenen Projeler

Vural E., TÜBİTAK Projesi, Zamanda Değişen Graf Sinyallerinin Eksik Gözlemlerden Kestirimi, 2021 - 2023

Vural E., Öktem S. F., TÜBİTAK Projesi, Düşük boyutlu veri kümeleri için grafa dayalı transfer öğrenme, 2017 - 2018

## Bilimsel Hakemlikler

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Mayıs 2020

NEURAL NETWORKS, SCI-E Kapsamındaki Dergi, Mayıs 2020

IEEE ACCESS, SCI-E Kapsamındaki Dergi, Mayıs 2020

IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING, SCI-E Kapsamındaki Dergi, Nisan 2020

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Mart 2020

JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS, SCI-E Kapsamındaki Dergi, Şubat 2020

INFORMATION FUSION, SCI-E Kapsamındaki Dergi, Aralık 2019

IEEE TRANSACTIONS ON CYBERNETICS, SCI-E Kapsamındaki Dergi, Aralık 2019

IEEE Access, SCI-E Kapsamındaki Dergi, Kasım 2019

IEEE TRANSACTIONS ON CYBERNETICS, SCI-E Kapsamındaki Dergi, Kasım 2019

IEEE TRANSACTIONS ON CYBERNETICS, SCI-E Kapsamındaki Dergi, Eylül 2019

IEEE TRANSACTIONS ON SIGNAL AND INFORMATION PROCESSING OVER NETWORKS, SCI-E Kapsamındaki Dergi, Eylül 2019

PATTERN RECOGNITION, SCI-E Kapsamındaki Dergi, Mayıs 2019

PATTERN RECOGNITION, SCI-E Kapsamındaki Dergi, Nisan 2019

IEEE TRANSACTIONS ON CYBERNETICS, SCI-E Kapsamındaki Dergi, Nisan 2019

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI Kapsamındaki Dergi, Aralık 2018

IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI Kapsamındaki Dergi, Aralık 2018

NEURAL PROCESSING LETTERS, SCI Kapsamındaki Dergi, Kasım 2018

JOURNAL OF ELECTRONIC IMAGING, SCI Kapsamındaki Dergi, Şubat 2018

DIGITAL SIGNAL PROCESSING, SCI-E Kapsamındaki Dergi, Aralık 2017  
DIGITAL SIGNAL PROCESSING, SCI-E Kapsamındaki Dergi, Temmuz 2016  
IEEE SIGNAL PROCESSING LETTERS, SCI-E Kapsamındaki Dergi, Mart 2016  
IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Şubat 2015  
IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Ocak 2015  
IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Kasım 2014  
IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Eylül 2013  
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IEEE TRANSACTIONS ON IMAGE PROCESSING, SCI-E Kapsamındaki Dergi, Şubat 2012

## **Metrikler**

Yayın: 49

Atf (WoS): 145

Atf (Scopus): 190

H-İndeks (WoS): 7

H-İndeks (Scopus): 7