

## Assoc. Prof. BURCU GÜLDÜR ERKAL

### Personal Information

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### International Researcher IDs

ORCID: 0000-0001-5757-736X

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### Education Information

Doctorate, Northeastern University, College of Engineering, Civil and Environmental Engineering, United States Of America 2010 - 2014

Postgraduate, Northeastern University, Mühendislik Fakültesi, İnşaat Ve Çevre Mühendisliği, United States Of America 2008 - 2010

Undergraduate, Middle East Technical University, Faculty Of Engineering, İnşaat Mühendisliği, Turkey 2004 - 2008

### Foreign Languages

German, A1 Beginner

French, B1 Intermediate

English, C1 Advanced

Spanish, A1 Beginner

### Dissertations

Doctorate, Laser-based Structural Sensing and Surface Damage Detection, Northeastern University, Civil And Environmental Engineering, 2014

Postgraduate, Implementation of Bender Elements in an Automated Triaxial Testing System for Measuring Clay Structure Restoration by Consolidation, Northeastern University, Civil And Environmental Engineering, 2010

### Research Areas

Geographic Information Systems and Remote Sensing, Remote sensing, Laser scanning, Artificial Intelligence, Computer Learning and Pattern Recognition, Pattern Recognition and Image Processing, Civil Engineering, Structure, Steel Structures, Performance of Constructed Facilities, Earthquake Engineering, Engineering and Technology

### Academic Titles / Tasks

Assistant Professor, Hacettepe University, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, 2015 - Continues

## Academic and Administrative Experience

Deputy Head of Department, Hacettepe University, Mühendislik Fakültesi, İnşaat Mühendisliği Bölümü, 2015 - 2017

## Courses

STRENGTH OF MATERIALS I, Undergraduate, 2017 - 2018, 2016 - 2017

STEEL STRUCTURES, Undergraduate, 2017 - 2018

STATİK VE MUKAVEMET, Undergraduate, 2016 - 2017

STATICS, Undergraduate, 2016 - 2017

SRENGTH OF MATERIALS II, Undergraduate, 2016 - 2017

DYNAMICS, Undergraduate, 2016 - 2017

## Advising Theses

Güldür Erkal B., Detection and quantification of pavement defects using unmanned aerial vehicle imagery, Postgraduate, T.YILDIZLI(Student), 2022

Güldür Erkal B., Comparison of core shear wall area to floor area ratio for reinforced concrete tall buildings, Postgraduate, M.FURKAN(Student), 2022

Güldür Erkal B., Experimental behavior monitoring of cold-formed steel members by feature tracking, Postgraduate, M.OZAN(Student), 2022

Güldür Erkal B., 3D point cloud-based imperfection determination of cold-formed steel members for numerical modeling, Postgraduate, Ö.GİZEM(Student), 2021

Güldür Erkal B., Development of decision support methods for restoration in earthquake-damaged medium voltage electrical distribution networks, Postgraduate, M.BAYRAKTAR(Student), 2021

Güldür Erkal B., Experimental and numerical analysis of cold formed steel columns and beams, Postgraduate, R.AKTEPE(Student), 2021

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Seismic risk prioritization of masonry building stocks using machine learning**  
COŞKUN O., AKTEPE R., ALDEMİR A., Yılmaz A. E., DURMAZ M., GÜLDÜR ERKAL B., TUNALI E.  
EARTHQUAKE ENGINEERING & STRUCTURAL DYNAMICS, 2024 (SCI-Expanded)
- II. **Prediction of the initial geometric imperfection magnitudes for numerical modeling of cold-formed steel channel sections**  
AKTEPE R., GÜLDÜR ERKAL B.  
Structures, vol.60, 2024 (SCI-Expanded)
- III. **State-of-the-art review on measurement techniques and numerical modeling of geometric imperfections in cold-formed steel members**  
AKTEPE R., GÜLDÜR ERKAL B.  
Journal of Constructional Steel Research, vol.207, 2023 (SCI-Expanded)
- IV. **MDP based real time restoration for earthquake damaged active distribution systems**  
Arpali O. Y., Yılmaz U. C., GÜLDÜR ERKAL B., AYDIN GÖL E., GÖL M.  
Electric Power Systems Research, vol.218, 2023 (SCI-Expanded)
- V. **Experimental investigation on lateral behavior of novel hybrid cold-formed steel walls with composite sheathing**  
AKTEPE R., AKDUMAN Ş., GÜLDÜR ERKAL B.  
Journal of Constructional Steel Research, vol.202, 2023 (SCI-Expanded)
- VI. **Experimental and numerical study on flexural behaviour of cold-formed steel hat-shaped beams with geometrical imperfections**

AKTEPE R., GÜLDÜR ERKAL B.

Journal of Constructional Steel Research, vol.202, 2023 (SCI-Expanded)

- VII. **Accurate geometric imperfection detection and quantification of cold-formed steel members from point clouds** **Nokta bulutlari kullanilarak hafif çelik elemanlardaki şekilsel kusurlarin doğru tespit edilmesi ve boyutlandırılması**  
Erkal B.  
Journal of the Faculty of Engineering and Architecture of Gazi University, vol.38, no.3, pp.1561-1575, 2023 (SCI-Expanded)
- VIII. **Automated Geometric Imperfection Detection and Quantification of CFS Members from Point Clouds**  
GÜLDÜR ERKAL B., Çağrıci O. G.  
KSCE JOURNAL OF CIVIL ENGINEERING, vol.26, no.9, pp.3888-3904, 2022 (SCI-Expanded)
- IX. **Using extracted member properties for laser-based surface damage detection and quantification**  
GÜLDÜR ERKAL B., Hajjar J. F.  
STRUCTURAL CONTROL & HEALTH MONITORING, vol.27, no.11, 2020 (SCI-Expanded)
- X. **Laser-based surface damage detection and quantification using predicted surface properties**  
Erkal B., Hajjar J. F.  
AUTOMATION IN CONSTRUCTION, vol.83, pp.285-302, 2017 (SCI-Expanded)
- XI. **Data Processing of Point Clouds for Object Detection for Structural Engineering Applications**  
Walsh S. B., Borello D. J., Guldur B., Hajjar J. F.  
COMPUTER-AIDED CIVIL AND INFRASTRUCTURE ENGINEERING, vol.28, no.7, pp.495-508, 2013 (SCI-Expanded)

## Books & Book Chapters

- I. **The Revisions for the Gusset Plate Load Rating Approach: A Comparative Case Study**  
BOYACI B., GÜLDÜR B.  
in: Developments in International Bridge Engineering Selected Papers from Istanbul Bridge Conference 2014, Alp Caner, Polat Gülkan, Khaled Mahmoud, Editor, Springer International Publishing, pp.41-50, 2016

## Refereed Congress / Symposium Publications in Proceedings

- I. **Kırılgnlık Eğrisi Kullanımının Elektrik Dağıtım Sistemlerinin Depremden Sonra Yeniden Ayağa Kaldırılmasına Etkisi**  
Bayraktar M., GÜLDÜR ERKAL B.  
18. Teknik Kongre, İstanbul, Turkey, 07 November 2022
- II. **Determination of Geometric Imperfections via 3D Data Processing**  
GÜLDÜR ERKAL B., Çağrıci Ö. G.  
CFSRC Colloquium 2022, United States Of America, 17 October 2022
- III. **Use of Fragility Curves in Restoring Electrical Distribution Systems after an Earthquake**  
Bayraktar M., GÜLDÜR ERKAL B., AYDIN GÖL E., GÖL M.  
Third European Conference on Earthquake Engineering and Seismology (3ECEES), Bükreş, Romania, 4 - 09 September 2022
- IV. **A Framework for Automated Bridge Inspections and Assessments with Visual Sensing Technology**  
Yan Y., GÜLDÜR ERKAL B., HAJJAR J. F.  
IABSE Symposium 2022, Prag, Czech Republic, 25 May 2022
- V. **Elektrik Dağıtım Sistemlerinin Depremden Sonra Yeniden Ayağa Kaldırılmasında Kırılgnlık Eğrisi Kullanımı**  
Bayraktar M., AYDIN GÖL E., GÖL M., GÜLDÜR ERKAL B.  
2022 TMMOB Afet Sempozyumu, Ankara, Turkey, 20 April 2022
- VI. **MDP based Decision Support for Earthquake Damaged Distribution System Restoration**

ARPALI O. Y., YILMAZ U. C., AYDIN GÖL E., GÜLDÜR ERKAL B., GÖL M.

IEEE PES General Meeting 2020, Montreal, Canada, 3 - 06 August 2020

- VII. **MATHEMATICAL MODEL FOR PREDICTING THE PERIOD OF VIBRATION OF CONCRETE GRAVITY DAMS WITH FULL RESERVOIR CONDITIONS**  
ALDEMİR A., Yücel Ö. B., GÜLDÜR ERKAL B.  
5. International Conference on Earthquake Engineering and Seismology, 8 - 11 October 2019
- VIII. **Image-based 3D surface reconstruction of cold-formed steel c-sections**  
GÜLDÜR ERKAL B.  
2019 European Conference on Computing in Construction, Girit, Greece, 10 - 12 July 2019
- IX. **Camera-Based Imperfection Determination of Cold-Formed Steel Members**  
GÜLDÜR ERKAL B., AKTEPE R., Alkoyak A. C., Bayraktar M., Demir B., Ünsal Z.  
Structures Congress 2019, Orlando, Florida, United States Of America, 24 - 27 April 2019
- X. **3D Model Generation of CFS Members from Surface Data**  
GÜLDÜR ERKAL B.  
4th International Conference on Structural Engineering and Concrete Technology (ICSECT'19), Roma, Italy, 07 April 2019
- XI. **A Novel MDP Based Decision Support Framework to Restore Earthquake Damaged Distribution Systems**  
AYDIN GÖL E., GÜLDÜR ERKAL B., AYDIN GÖL E.  
IEEE PES Innovative Smart Grid Technologies Europe (IEEE ISGT-Europe), Bucharest, Romania, 29 September - 02 October 2019
- XII. **Laser scanning coupled with high-definition color imaging for defect localization and quantification**  
GÜLDÜR ERKAL B.  
13th Advances in Civil Engineering Congress, İzmir, Turkey, 12 - 14 September 2018
- XIII. **Bridge Surface Damage Detection Application With A Laser-Based Software Prototype**  
GÜLDÜR ERKAL B., Apaydın N.  
4th International Workshop on Geoinformation Science: GeoAdvances 2017, Karabük, Turkey, 14 - 15 October 2017
- XIV. **Automated Structural Modelling of Bridges from Terrestrial Laser Scanning**  
Yan Y., GÜLDÜR ERKAL B., Hajjar J. F.  
ASCE/SEI Structures Congress 2017, Colorado, United States Of America, 6 - 08 April 2017
- XV. **The Prototype of a Software Application for Laser and Image-based Surface Damage Detection**  
GÜLDÜR ERKAL B.  
2nd World Congress on Civil, Structural, and Environmental Engineering (CSEE'17), Barcelona, Spain, 2 - 04 April 2017
- XVI. **Automated Structural Modelling of Bridges from Laser Scanning**  
Yan Y., GÜLDÜR ERKAL B., Hajjar J. F.  
Structures Congress, Colorado, United States Of America, 6 - 08 April 2017, pp.457-468
- XVII. **Automated Classification of Detected Surface Damage from Point Clouds with Supervised Learning**  
GÜLDÜR B., Hajjar J. F.  
33rd International Symposium on Automation and Robotics in Construction, Auburn, AL, United States Of America, 18 - 21 July 2016
- XVIII. **Automated Damage Detection and Structural Modelling with Laser Scanning**  
YAN Y., GÜLDÜR B., YODER L., KASIREDDY V., HUBER D., SCHERER S., AKINCI B., HAJJAR J. F.  
Structural Stability Research Council Annual Stability Conference, Orlando, FL, United States Of America, 12 - 15 April 2016
- XIX. **The Revisions for the Gusset Plate Load Rating Approach: A Comparative Case Study**  
Boyaci B., GÜLDÜR ERKAL B.  
Istanbul Bridge Conference, Turkey, 11 - 13 August 2014, vol.9, pp.41-50
- XX. **Condition Assessment of Bridges Using Terrestrial Laser Scanners**  
GÜLDÜR B., YAN Y., HAJJAR J.

Structures Congress 2015, Portland, Oregon, United States Of America, 23 - 25 April 2015, pp.355-366

**XXI. Automated Damage Assessment from 3D Laser Scans**

GÜLDÜR B., HAJJAR J.

Istanbul Bridge Conference, İstanbul, Turkey, 11 - 13 August 2014

**XXII. Damage Detection on Structures Using Texture Mapped Laser Point Clouds**

GÜLDÜR B., HAJJAR J.

Structures Congress 2014, Boston, Massachusetts, United States Of America, 3 - 05 April 2014, pp.324-334

**XXIII. Laser based Automatic Cross Sectional Change Detection for Steel Frames**

GÜLDÜR B., HAJJAR J.

9th International Workshop on Structural Health Monitoring, Stanford, California, United States Of America, 10 - 12 September 2013

**XXIV. Indication of Clay Structure Restoration in Laboratory Testing Using Bender Element Measurements**

GÜLDÜR B., SHEAHAN T.

International Symposium on Deformation Characteristics of Geomaterials, Seoul, South Korea, 31 August - 03 September 2011, pp.258-265

## Supported Projects

Aldemir A., Güldür Erkal B., Durmaz M., Tunalı E., TUBITAK Project, Yapıların Sismik Etkilerden Kaynaklı Bölgesel Risk Dağılımlarının Belirlenmesinde Makine Öğrenmesi Ve Görüntü İşleme Algoritmaları Temelli Yeni Nesil Yaklaşım Modelinin Geliştirilmesi, 2022 - 2024

GÜLDÜR ERKAL B., TUBITAK Project, Yollardaki Çatlak Ve Çukurlarının İnsansız Hava Aracıyla Toplanan Görüntülerden Tespiti, 2020 - 2021

Güldür Erkal B., TUBITAK Project, Depremde Zarar Görmüş Orta Gerilim Elektrik Dağıtım Şebekelerinde Ayağa Kaldırma için Karar Destek Yöntemlerinin Geliştirilmesi, 2018 - 2021

GÜLDÜR ERKAL B., TUBITAK Project, Hafif Çelik Elemanlardaki Şekilsel Kusurların Üç Boyutlu Veri Bulutlarından Tespit Edilmesi Ve Nümerik Modellemede Kullanılması, 2018 - 2021

GÜLDÜR ERKAL B., Project Supported by Higher Education Institutions, Hafif Çelik Elemanlardaki Şekilsel Kusurların Kameralarla Tespit Edilmesi ve Tespit Edilen Kusurların Eleman Davranışı üzerindeki Etkilerinin İncelenmesi, 2017 - 2019

ÖZTÜRK B., GÜLDÜR B., Project Supported by Higher Education Institutions, İnşaat Mühendisliği Bölümü Yapı Mekaniği ve Yapı Malzemesi Laboratuvarları Makine-Techizat Alımı, 2016 - 2019

GÜLDÜR ERKAL B., TUBITAK Project, Lazer Tarayıcılarla Yapılarda Otomatik Yüzey Hasar Tespiti ve Yüzeysel Hasar Derecelerini Belgelendirilme Yazılımı, 2015 - 2017

GÜLDÜR ERKAL B., Project Supported by Higher Education Institutions, Lazer Tarayıcılar Kullanılarak Köprülerde Durum Tespiti (Condition Assessment of Bridges Using Terrestrial Laser Scanners), 2015 - 2015

## Metrics

Publication: 36

Citation (WoS): 64

Citation (Scopus): 127

H-Index (WoS): 4

H-Index (Scopus): 5

## Non Academic Experience

Northeastern University

