

## **Dr. E. Ece (Eseller) Bayat**

### **Assistant Professor**

Istanbul Technical University Faculty of Civil Eng.

Room 264 Maslak Istanbul, Turkey 34469

E-mail: ebayat@itu.edu.tr

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#### **Education**

**Ph.D., in Civil and Environmental Engineering, Major:** Geotechnical & Earthquake Engineering

**Northeastern University, Boston, MA**

**Graduation Date:** August 2009

**Thesis:** "Seismic Response and Prevention of Liquefaction Failure of Sands Partially Saturated through Introduction of Gas Bubbles."

**Project:** "Liquefaction mitigation using entrapped air" NSF Project CMS-0509894.

**Relevant Coursework:** Groundwater Hydraulics and Quality Modeling, Independent Study: Seismic Passive Earth Resistance of Foundations and Evidences in Improving the Passive Resistance of Foundations, Finite Element Method, GIS (Geographic Information Systems), Probability and Statistics for Engineers, Structure Dynamics.

**MS, in Civil and Environmental Engineering, Major:** Geotechnical & Earthquake Engineering

**Northeastern University, Boston, MA**

**Graduation Date:** September 2004

**Cumulative GPA: 4.00/4.00**

**Master Thesis:** "Induced Partial Saturation for Liquefaction Mitigation"

**Project:** "Air entrapment for liquefaction mitigation" NSF SGER CMS-0234365

**Relevant Coursework:** Advanced Soil Mechanics, Introduction to Earthquake Engineering, Advanced Foundation Engineering, Soil Dynamics, Earthquake Engineering, Engineering Geology, Geoenvironmental Engineering

**BS in Civil Engineering METU, Ankara, Turkey**

**Graduation Date:** June 2002

**Cumulative GPA: 3.85 /4.00**, ranked in the top four students

#### **Computer Skills**

FLAC<sup>3D</sup> ITASCA Geotechnical Engineering Software, Geomotions Shake 2000, Proshake, Geo5 Fine Software (Geotechnical Software), MATLAB, GIS, LABVIEW 7.0, DasyLAB, ANSYS, AutoCAD, Strong Motion Analyst, ALTUS QuickTalk, MS Office Professional 2013 (Microsoft Word, Excel, Power Point, FrontPage).

#### **Instrumentation**

##### **Skills**

Mt Withney, K2, Strong Motion Array, Weak Motion Array, Shaking Table (MTS), NIDAQ, LabVIEW, Soil laboratory testing instruments; pore pressure transducers, signal conditioners, LVDT, bender elements and/or P and S wave measurement transducers, Cyclic Simple Shear Test Apparatus

#### **Language**

##### **Skills**

Native in Turkish, very fluent in English and moderate in French

## Work Experience

<b>Istanbul Technical University, Turkey</b> International Education Vice Dean	11/2012-present
<b>Istanbul Technical University, Turkey</b> Assistant Professor	04/2010-present
<b>Istanbul Technical University, Turkey</b> ITU-University of Illinois UC BS+MS Program Coordinator	02/2011-present
<b>Istanbul Technical University, Turkey</b> Assistant to the President	01/2011-08/2012
<b>Istanbul Technical University, Turkey</b> President Coordinator for Strategic Planning and Development	08/2010-01/2011
<b>Northeastern University, Boston, MA</b> Research Associate	09/2009-03/2010
<b>Museum of Fine Arts, Boston, MA</b> Member of the consultant team <ul style="list-style-type: none"><li>• On seismic evaluation of 4 artifacts</li></ul>	09/2008-10/2008
<b>Northeastern University, Boston, MA</b> Instructor	01/2008-09/2008
<b>Northeastern University, Boston, MA</b> Research Assistant	01/2006-09/2009
<b>Northeastern University, Boston, MA</b> Teaching Assistant	09/2003-12/2005
<b>CDM, Consulting, Eng., Const., Operations Company, Cambridge, MA</b> Coop as a Geotechnical Engineer <ul style="list-style-type: none"><li>• Worked in the soil lab in Global CECO division.</li><li>• Performed the soil laboratory tests (hydraulic conductivity, triaxial test, compaction and etc), according to ASTM, on the samples from several projects in US (e.g. Onslow County, Central Artery), performed the analysis and presented to the clients.</li></ul>	07/2003- 09/2003
<b>Northeastern University, Boston, MA</b> Monitoring Seismic Recording Station <ul style="list-style-type: none"><li>• Monitored strong motion array, weak motion array by which we can record any big earthquake happening all around the world, and Kinemetrics MtWhitney which records the wave velocities through the Boston blue clay layers</li><li>•</li></ul>	09/2002-06/2003
<b>Prokon Ltd. Construction Company, Ankara, Turkey</b> Civil engineer in the Reinforced Concrete Project Department <ul style="list-style-type: none"><li>• Worked on the retaining wall design project in Turkey. I made all stability and safety design calculations with my supervisor</li><li>• Worked in the design of a silo in SAP 2000</li></ul>	09/2001

**METU, Ankara, Turkey** 07/2001-09/2001  
 Civil Engineer in the construction of the new dormitories  
 4 floor two dormitory buildings were finished in 2.5 months. I had chance to see and work in a construction from the beginning to the end.

- Learned to read the project and applied it in the field.
- Worked on the foundation design and applied it in the field.
- Managed and supervised workers in the rough works.
- Managed concrete works, directed slump tests and concrete samples lab works.

**MNG Ltd. Construction Company, Ankara, Turkey** 07/2000 - 08/2000  
 Civil Engineer in the construction of 2 residential tall building

- Learned form works.
- Learned and controlled checking the steel design project in the field.

## Consulting Projects

Geotechnical Evaluation Report on Improvement of the Quay Wall next to the Kabataş Erkek High school Dormitory	2017
Geotechnical Report on the Evaluation of the Site Investigation and Foundation Report on Forensic Medicine Additional Building in Bahçelievler Istanbul.	2017
Geotechnical Report on the Evaluation of the Interaction btw Existing Metro Tunnel to Sabiha Gokcen Airport and the new building to be constructed in Istanbul Pendik Fevzi Çakmak Neighborhood 22 Pafta 4741 Parsel	2017
Geotechnical Evaluation of Masonry Retaining Walls located in Mesarburnu Avenue 105 Pafta 86 Ada, Merkez District, Sariyer, Istanbul as a part of Elite Shore Project	2017
Geotechnical Evaluation Report on Liquefaction Potential and Jet Grout Design for the New Cultural Building of the Çanakkale Municipality in Çanakkale.	2017
Geotechnical Report on the Evaluation of the Foundation System of Toyota/Tsuscho Factory in Adapazarı due to local settlements on the basement floor and the remediation options	2017
Geotechnical Evaluation Report on the Effect of the Loads of the New Building to be built in Kadikoy on the Existing Metro Tunnels	2017
Geotechnical Report on the Evaluation of the Site Investigation and Suggestion for Foundation System Design of an Apartment Complex with 6 High Rise Buildings and Shopping Centers in Kumburgaz, Istanbul	2016
Geotechnical Report on the Evaluation of the Site Investigation and Foundation System Design of a residential Building in Maltepe Istanbul	2016
Geotechnical Evaluation Report on Liquefaction Potential and Jet Grout Design for The foundation soil of Garanti Bankası Building in Konak, İzmir	2016
Geotechnical Evaluation Report on the Effect of the Loads of the New Building to be built in Bakirkoy on the Kirazlı Metro Tunnels	2016
Geotechnical Evaluation Report on Liquefaction Potential for a residential site in Mudanya, Bursa	2016
Technical Report on Restoration of Yıldız Palace Cihannüma Mansion	2016
Evaluation of a Historic masonry wall (1000 yrs old) in Kocaeli and technical report on Immediate Restoration Options	2016
Reinforcement of Davutpaşa Historic Medrese (School) Foundation in Istanbul	2016
Geotechnical Report on the cautions to be taken during the foundation excavation of a new high rise building next to Park Plaza in Maslak Istanbul	2016
Damage Evaluation of a residential building due to foundation excavation of a neighbor building in Bahçeşehir/Istanbul	2015
Damage Evaluation of a residential building due to foundation excavation of a neighbor building in Çatalca/Istanbul	2015

## Research Projects

Tübitak 3501 Career Project Title: Dynamic Response of Sands Mitigated by IPS (Induced Partial Saturation) under New and Existing Structures, PI, 218,850 TL	2014-2017
NSF CMS-0509894: "Liquefaction mitigation using entrapped air" Researcher, Mishac Yegian (PI) and A. Alshawabkeh (Co-PI), \$206,500	2005-2009
NSF SGER CMS-0234365: "Air entrapment for liquefaction mitigation", Researcher Mishac Yegian (PI) and A. Alshawabkeh (Co-PI), \$50,000	2002-2003

## Journal Publications

- **Eseller-Bayat, E.E.** and Ada, M. (2017) "A Methodology for Estimation of Site Specific Nonlinear Dynamic Soil Behavior Using Vertical Downhole Arrays" *Journal of Earthquake and Tsunami*, (under review)
- **Eseller-Bayat, E.E.**, Monkul, M. M., Akın, Ö. And Yenigün, Ş. (2017) "The Coupled Influence of Relative Density, CSR, Plasticity and Content of Fines on Cyclic Liquefaction Resistance of Sands", *Journal of Earthquake Engineering* (online published).
- M. Murat Monkul, Cihan Gültekin, Müge Gülver, Özge Akın, **Ece Eseller-Bayat** (2015) "Estimation of liquefaction potential from dry and saturated sandy soils under drained constant volume cyclic simple shear loading" *Soil Dynamics and Earthquake Engineering*, 75, 27-36.
- **Eseller-Bayat, E.**, Yegian M.K., Alshawabkeh, A. and Gokyer, S. (2013) "Liquefaction Response of Partially Saturated Sands: Experimental Results" *ASCE, Journal of Geotechnical and Geoenvironmental Engineering* 139 (6) pp. 863-871.
- **Eseller-Bayat, E.**, Yegian M.K., Alshawabkeh, A. and Gokyer, S. (2013) "Liquefaction Response of Partially Saturated Sands: An Empirical Model" *ASCE, Journal of Geotechnical and Geoenvironmental Engineering* 139 (6) pp. 872-879.
- **Eseller-Bayat, E.**, Gokyer, S., Yegian, M. K., Ortakci, E. and Alshawabkeh, A. (2013) "Design and Application of Simple Shear Liquefaction Box" *ASTM Geotechnical Testing Journal*, 36(3).
- **Eseller-Bayat, E.**, Gokyer, S., Yegian, M. K., Deniz, O and Alshawabkeh, A. (2013) "Bender Elements and Bending Disks for Measurement of Shear and Compression Wave Velocities in Large Fully and Partially Saturated Sand Specimens" *ASTM Geotechnical Testing Journal*, 36(2).
- Yegian, M. K., **Eseller-Bayat, E.**, Alshawabkeh, A., Ali, S. (2007). "Induced Partial Saturation (IPS) for Liquefaction Mitigation: Experimental Investigation", *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 133(4).

## Conference Proceedings

- Seyed Mohsen Seyedi Viand and **E.Ece Eseller-Bayat** (2017) "Numerical Modelling of Liquefaction Tests of Partially Saturated Sands in CSSLB" *Advances in Laboratory Testing and Modelling of Soils and Shales (ATMSS) Springer Series in Geomechanics and Geoengineering, Ed. Alessio Ferrari and Lyessse Laloui, pp. 139.*
- Derya Burcu Gülen and **E. Ece Eseller-Bayat** (2017) "Specimen Preparation Techniques for Testing Fully and Partially Saturated Sands in Dynamic Simple Shear (DSS) Test Device with Confining Pressure" *Advances in Laboratory Testing and Modelling of Soils and Shales*

(ATMSS) *Springer Series in Geomechanics and Geoengineering*, Ed. Alessio Ferrari and Lyesse Laloui, pp. 139.

- **E.Ece Eseller-Bayat**, Ataollah Nateghi, Seyed Mohsen Seyedi Viand, Navid Jadidoleslam (2016) "Numerical modelling of liquefaction tests of fully saturated sands in CSSLB" 4th *International Conference on New Developments in Soil Mechanics and Geotechnical Engineering*, Nicosia, North Cyprus.
- Özlem Balcıoğlu and **Ece Eseller-Bayat** (2014) "Zeminin Statik ve Dinamik Yükler Altında Davranışını Belirlemede Analitik ve Nümerik Analizlerin Karşılaştırılması: Bir Vaka Analizi" (Comparison of Analytical and Numerical Analyses for Determination of Soil Behavior under Static and Dynamic Loads: A Case Study) *Zemin Mekaniği ve Temel Mühendisliği Onbeşinci Ulusal Kongresi ZM15*, October, Ankara, Turkey
- Özlem Balcıoğlu and **Ece Eseller-Bayat** (2014) "Liquefaction Analysis and Ground Improvement of Sakarya - Karasu Region using Numerical Modelling (FLAC 3D): A Case Study", 2<sup>nd</sup> *European Conference on Earthquake Engineering and Seismology*, August, Istanbul, Turkey.
- Özge Akın, M. Murat Monkul, **Ece Eseller-Bayat** (2013) "Basit Kesme Deneyi için Homojen ve Suya Doygun Numune Hazırlama Yöntemleri (Saturated and Homogeneous Specimen Preparation Methods for Cyclic Simple Shear Tests)" 5. *Geoteknik Sempozyumu*, December, Adana, Turkey.
- Ada M., **Eseller-Bayat E.** and Bulut Y. (2013) "Estimation of Dynamic Soil Properties using Downhole Acceleration Records" *International Conference on Earthquake Geotechnical Engineering: From Case History to Practice*. June, 2013, Istanbul, Turkey.
- **E. Eseller-Bayat**, M. K. Yegian, A. Alshawabkeh., S. Gokyer (2011) "Prevention of Liquefaction during Earthquakes through Induced Partial Saturation in sands", 21st *European Young Geotechnical Engineers' Conference*, Rotterdam.
- **Eseller-Bayat, E.**, Yegian, M. K., Alshawabkeh, A., Gokyer, S. (2009) "A New Mitigation Technique for Preventing Liquefaction-Induced Building Damages during Earthquakes" *Civil Engineering Disaster Mitigation Activities Concerning Earthquake and Tsunami WCCE-ECCE -TCCE Joint Conference*, June 2009, Istanbul, Turkey.
- **E. Eseller-Bayat**, M. K. Yegian, A. Alshawabkeh. (2007) "Liquefaction Mitigation Using Entrapped Air" *Northeast Geotechnical Research Symposium*, University of Massachusetts, Amherst, MA, October 2007
- R. O. Deniz, M. K. Yegian, **E. Eseller-Bayat**, A. Alshawabkeh (2007) "Bender Element Test Setup for Large Soil Specimens" *Northeast Geotechnical Research Symposium*, University of Massachusetts, Amherst, MA, October 2007
- M.K. Yegian, **E. Eseller**, A. Alshawabkeh (2006) "Preparation and Cyclic Testing of cPartially Saturated Sands". *ASCE Geotechnical Special Publication (GSP) 147*, pp. 508-518.

## Book Chapters

- **Eseller-Bayat, E.**, Gokyer, S. and Yegian, M.K. (2013) " Seismic Evaluation and Rehabilitation of Structures" Ed: Ilki, A. and Fardis, M. N., Chapter 21, pp. 379, Springer.

## Seminars Presentations

Presentation on " Saturated and Homogeneous Specimen Preparation Methods for Cyclic Simple Shear Tests (Basit Kesme Deneyi için Homojen ve Suya Doygun Numune Hazırlama Yöntemleri)" 5. *Geoteknik Sempozyumu*, December, Adana, Turkey, 2013

Invited Speaker on "Earthquake Engineering Experimental Facility for Research and Public Outreach", SERIES International Workshop, Role of Seismic Infrastructures in Seismic Rehabilitatio, ITU Istanbul Turkey, 2012

Invited Speaker on "Prevention of Liquefaction during Earthquakes through Induced Partial Saturation in sands", 21<sup>st</sup> European Young Geotechnical Engineers' Conference, Rotterdam, 2011

Invited Speaker on "A New Liquefaction Mitigation Technique: "Induced Partial Saturation (IPS)", Zetas Lecture Series No.02-2009, Zetas Zemin Teknolojisi A.S., October, 2009, Istanbul, Turkey

Invited Speaker on "A New Mitigation Technique for Preventing Liquefaction-Induced Building Damages during Earthquakes", Civil Engineering Disaster Mitigation Activities Concerning Earthquake and Tsunami WCCE-ECCE -TCCE Joint Conference, June 2009, Istanbul, Turkey.

Presentation on "Earthquake Engineering and Shaking Table Facility", Society of Women in Engineering (SWE), "Reach for Stars" 2007 SWE Region F Conference, April 14, 2007, Boston, MA

Technical presentation on "Liquefaction Mitigation Using Entrapped Air", Northeast Geotechnical Research Symposium, University of Massachusetts, Amherst, MA, October, 2007.

Invited speaker on "Civil Engineering Earthquake Research and Shaking Table", Society of Women in Engineering (SWE) Boston meeting, November 2007, Boston MA

## Citation

25 (SCI) Total 78 : Yegian, M. K., Eseller-Bayat, E., Alshawabkeh, A., Ali, S. (2007). "Induced Partial Saturation (IPS) for Liquefaction Mitigation: Experimental Investigation", Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 133(4).

5 : M.K. Yegian, **E.Eseller**, A. Alshawabkeh (2006) "Preparation and Cyclic Testing of Partially Saturated Sands". ASCE Geotechnical Special Publication (GSP) 147, pp. 508-518.

6 (SCI) Total 18: **Eseller-Bayat, E.**, Yegian M.K., Alshawabkeh, A. and Gokyer, S. (2013) "Liquefaction Response of Partially Saturated Sands: Experimental Results" ASCE, Journal of Geotechnical and Geoenvironmental Engineering 139 (6) pp. 863-871.

1 (SCI) Atıf : **Eseller-Bayat, E.**, Yegian M.K., Alshawabkeh, A. and Gokyer, S. (2013) "Liquefaction Response of Partially Saturated Sands: An Empirical Model" ASCE, Journal of Geotechnical and Geoenvironmental Engineering 139 (6) pp. 872-879.

1 (SCI) Atıf **Eseller-Bayat, E.**, Gokyer, S., Yegian, M. K., Ortakci, E. and Alshawabkeh, A. (2013) "Design and Application of Simple Shear Liquefaction Box" ASTM Geotechnical Testing Journal, 36(3).

3 (SCI) Atıf **Eseller-Bayat, E.**, Gokyer, S., Yegian, M. K., Deniz, O and Alshawabkeh, A. (2013) "Bender Elements and Bending Disks for Measurement of Shear and Compression Wave Velocities in Large Fully and Partially Saturated Sand Specimens" ASTM Geotechnical Testing Journal, 36(2).

2 (SCI) Total 5: M. Murat Monkul, Cihan Gültekin, Müge Gülver, Özge Akın, **Ece Eseller-Bayat** (2015)  
 "Estimation of liquefaction potential from dry and saturated sandy soils under drained constant volume cyclic simple shear loading " Soil Dynamics and Earthquake Engineering, 75, 27-36.

### Teaching and Outreach Experience

Soil Dynamics (3 credits graduate course)  
 Foundation Dynamics (3 credits graduate course)  
 Foundation Engineering (2.5 credits)  
 Soil Mechanics (3+2 credits)  
 Probability and Statistics for Engineering (3 credits)  
 Technical Communication Skills (non-credit)  
 Civil Engineering Fundamental Exam (FE) Lectures on Soil Engineering  
 Soil Mechanics Laboratory (1 credit)  
 Surveying and Engineering Measurements Laboratory (1 credit)  
 Structure Analysis Problem Sessions  
 Outreach Activities: Shaking Table Demos on Civil and Earthquake Engineering to raise awareness and interest on engineering and physical science for K-12, high school and female students and professionals. Application of Physics and Math on engineering is demonstrated.  
 Mentor in NSF Young Scholar Program at Northeastern University.

### Graduate Students

Student	Degree	Thesis Title	Expected Date
Cagdas Cayakan	MS Student	Estimation of Partial Saturation To Be Induced In Liquefiable Sands For Mitigation Using Artificial Neural Network Approach	January 2012
Mehmet Ada	MS Student	Estimation of Dynamic Soil Properties using System Identification Techniques	August 2013
Özge Akın	MS Student	Influence of Plasticity And Fines Content on Cyclic Behaviour of Sand	April 2014
Özlem Balcıoğlu	MS Student	Liquefaction Analysis and Ground Improvement of Sakarya Karasu Region Using Numerical Modelling (FLAC 3D): A Case Study	August 2014
Ata Nateghi	MS Student	Numerical Modelling of Sand Behavior under Cyclic Simple Shear Tests in a Special Liquefaction Box	August 2015
Ehsan Yahyinar	MS Student	Effect of Dynamic Loading on the Pipelines	August 2016
Fatih Saraçoğlu	MS Student	Normalized Response Spectrum for Seismic Design Of Buildings On Different Soils	August 2017
Derya Burcu Gülen	MS Student	Undrained Dynamic Response of Fully and Partially Saturated Sands through Dynamic Simple Shear Test Device with Confined Pressure	August 2017

Şenay Yenigün	MS Student	Development of an Automated dry Funnel Deposition Technique for Specimen Preparation in Liquefaction Tests	December 2017
İlker Gür	MS Student	Evaluation of Jet Grouts for Complete Seismic Design of Foundations	December 2017
Murat Batuhan Koçak	MS Student	Evaluation of Liquefaction Potential of Sands under Buildings	December 2017
Barış Hotamış	MS Student		December 2018
S.Mohsen Seyedi Viand	Ph.D Student	Numerical Modeling of the Partially Saturated Sands for Dynamic Analysis and Liquefaction Behavior	May 2018
Ozan Alver	Ph.D Student	A new model for Lateral Pile Behavior in Sands under Earthquake Excitations	May 2020

## Other Advising

### Undergraduate Students:

Kaitlin Vacca, Undergraduate Research Assistant, Northeastern University 2004-2006, NSF-REU  
Keith Hall, Undergraduate Research Assistant, Northeastern University 2009-2010, NSF-REU  
Meredith Washington, Undergraduate Research Assis., Northeastern University 2008, NSF-REU  
Joshua Zeidel, Undergraduate Research Assistant, Tufts University, 2008

### Visiting High School Scholars:

Laura Kvenvold, NSF Young Scholar Program, 2006 Summer, currently at Tufts University  
Linda Nguyen, NSF Young Scholar Program, 2006 Summer, currently at Boston University  
Paola Alexandra Baez, NSF Young Scholar Program, 2007 Summer.  
Rahul Desai, NSF Young Scholar Program, 2007 Summer currently at Northeastern Univ.  
Alicia Lombardo, NSF Young Scholar Program, 2008 Summer.  
David Gertner, NSF Young Scholar Program, 2008 Summer, currently at Tufts University

## Personal Involvements And Awards

ASCE Thomas A. Middlebrook Award 08/2014  
*Best Contribution to the field of Geotechnical Engineering in year 2014*  
Third Prize in the Geosyntec Consultants Abstract Competition,  
"2007 Northeast Geotechnical Graduate Research Symposium", Amherst MA 10/2007  
Outstanding Teaching Award, College of Engineering, Northeastern University 05/2004  
Volunteered graduate student in the 100th Anniversary Earthquake Conference, California.04/2006  
Research Assistantship, National Science Foundation-Northeastern University 2005-2009  
Teaching Assistantship, Northeastern University 2002-2005  
Ranked as the top student of the Ankara Anatolia High School 01/1997  
Reviewer in the Journal of Engineering Computations, Soils and Foundations, Soil dynamics and Earthquake engineering  
Member of ASCE (American Society of Civil Engineers)  
Member of EERI (Earthquake Engineering Research Institute)  
Member of GEO Institute (ASCE Geotechnical Engineering Institute)  
Member of IMO (Turkish Society of Civil Engineers)  
Member of ZMGM (Turkish Society of Soil Mechanics and Geotechnical Engineering)



Member of American National Scholars Honor Society  
Member of Society of Women in Engineering in United States (SWE)

**Activities**      Fitness, skiing, reading, squash, traveling, internet, movies