CURRICULUM VITAE
of
Evangelia ("Eva") Agapaki

Ph.D. Student and Charles M. Vest Scholar

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Personal website: https://www.evagapaki.com

1. OBJECTIVE

A full-time tenure track faculty position at the Assistant Professor level in the Department of Civil and Environmental Engineering. My current work extends towards 3D Modelling of existing Industrial Facilities using point cloud data and deep learning methods.

2. EDUCATION

September 2016-September 2019 (tentative): Ph.D. in Engineering, University of Cambridge (U.K.) (in progress)
Research: **"**As-is Modelling of Industrial Facilities"

> *Automation of the generation of as-is geometric Building Information Models (BIMs) of industrial facilities using a novel hybrid approach that will take advantage of the importance of industrial object types to progressively segment point cloud data through fitting template objects and simultaneously assigning their connectivity relationships. The key novel idea that makes this possible is that the most important object types are typically cylindrical and non-cylindrical objects, which will be connected using machine learning and probabilistic methods.*

Division: Construction Engineering
Courses attended: *Computer Vision & Robotics, Statistical Machine Learning, Image Processing & Image Coding*
Supervisor: Dr. Ioannis Brilakis
Advisor: Professor Duncan McFarlane

September 2018-August 2019: Charles M. Vest Scholar, Massachusetts Institute of Technology (in progress)
Research: "Deep learning methods for point cloud data and inference rules for modelling industrial systems"
Division: Computer Science and Artificial Intelligence Laboratory
Courses attended: *Computer Vision*
Advisor: Dr. Justin Solomon

September 2015-January 2016: Visiting researcher at UC Davis
Research: "Development of validated methods for soil-structure interaction analysis for buried structures", Centrifuge experiment at UC Davis
Collaborators: Professor Scott Brandenberg, Professor Jonathan Stewart, Professor Ertugrul Taciroglu, Dr. Dan Wilson, Dr. Elnaz Esmaeilzadeh Seilabi, Dr. Dimitris Pitilakis

September 2015-July 2016: Structural & Geotechnical Earthquake Engineering, University of California, Los Angeles
GPA: 3.79 / 4.00
Research: "Development of validated methods for soil-structure interaction analysis for buried structures", Centrifuge experiment at UC Davis
Advisors: Professor Scott Brandenberg, Professor Jonathan Stewart

June 2015: Master of Science (M.S.) in Geotechnical Earthquake Engineering, University of California, Los Angeles
GPA: 3.89 / 4.00
Rank: 1st student in Geotechnical Engineering class of 2014-2015
Research project: "Residual Analysis of Hellenic Data relative to global ACR Ground Motion Prediction Equation (GMPE)"

June 2014: Diploma (5-year program) in Civil Engineering, University of Patras, Greece
Rank*:* top 1% (2nd out of 200)
GPA*:* 8.42 / 10.00
Advisor: Professor George Mylonakis
Diploma thesis*:* "Higher-Order Winkler Solutions for Flexible Piles and Walls"

3. PUBLICATIONS

Published/Accepted Journal Articles

- **Agapaki, E.**, Brilakis, I. (2018) Prioritizing Object Types for Modelling Existing Industrial Facilities, Automation in Construction Journal, Vol. 93, 211-223, Elsevier.
- Seylabi, E., **Agapaki, E.**, Pitilakis, D., Brandenberg, S., Stewart, J., Taciroglu, E. (2018) Data Paper: Centrifuge Testing of Circular and Rectangular Embedded Structures with Base Excitations, Earthquake Spectra, EERI (accepted).

In preparation Journal Articles

- Sheila, M., **Agapaki, E.**, Brilakis, I. (2018) The Skills and Attributes of Managers and Executives in the Construction Industry (under preparation)
- **Agapaki, E.,** Brilakis, I., Solomon, J. (2019) Instance Segmentation of the most important industrial shapes in point cloud data (under preparation)

Book Chapter

- **Agapaki, E.**, Nahangi, M. (2018) Chapter 3: ICV scene understanding and model generation, *Infrastructure Computer Vision*, Elsevier (under review).

Conference Papers

- **Agapaki, E.,** Glyn-Davies, A., Mandoki, S. and Brilakis, I. (2019) CLOI: A Shape Classification Benchmark Dataset for Industrial Facilities, 2019 ASCE International Conference on Computing in Civil Engineering, Atlanta, 17-19 June 2019 (under review).
- **Agapaki, E.**, Brilakis, I. (2018) What objects are most important when modelling existing industrial facilities?, 17th International Conference on Computing in Civil and Building Engineering, Tampere, 5-7 June 2018.
- **Agapaki, E.,** Brilakis, I. (2018) State-of-practice on As-Is Modelling of Industrial Facilities, 25th International Workshop on Intelligent Computing in Engineering, Lausanne, 10-13 June 2018.
- **Agapaki, E.,** Karatzia, X., Mylonakis, G. (2018) Higher Order Winkler Solutions for Flexible Piles, 16th European Conference on Earthquake Engineering, Thessaloniki, 18-21 June 2018.
- **Agapaki, E.**, Brilakis, I. (2017) Prioritizing Object Types of Industrial Facilities to reduce As-Is Modelling time, Association of Researchers in Construction Management (ARCOM), 33rd Annual Conference, Cambridge, U.K., 4-6 September 2017.
- Brandenberg, S.J., **Agapaki, E.**, Mylonakis, G., Stewart, J.P. (2017) Kinematic Framework for Evaluating Seismic Earth Pressures, 16th World Conference of Earthquake Engineering, Santiago Chile.
- **Agapaki, E.**, Esmaeilzadeh, S.S., Brandenberg, S.J., Stewart, J.P., Taciroglu, E., Pitilakis, D. (2016) "Centrifuge modeling of culvert structures to evaluate seismic earth pressures arising from soil-structure interaction", 1st International Conference on Natural Hazards & Infrastructure, 28-30 June 2016, Chania, Greece.
- **Agapaki, E.**, Mylonakis G. (2013), "Higher-Order Winkler Solutions for Flexible Piles and Walls", 7th Hellenic Conference on Geotechnical Engineering Mechanics, Athens, Greece.

Reports

- **Agapaki,** E. (2017). "As-Is Modelling of Industrial Facilities, First Year Report, University of Cambridge, August 2017.

- Seylabi, E., Zhang, W., **Agapaki, E.**, Pitilakis, D., Brandenberg, S., Stewart, J., Taciroglu, E. (2017) Development of Validated Methods for soil-structure analysis of buried structures, Caltrans Final Report No. CA17-2754.
- Nikolaou et al. (2014). "Reconnaissance Report on Geological, Seismological and Engineering Effects of the January 26 and February 3, 2014 Earthquakes in Cephalonia, Greece", GEER Report.

Undergraduate Thesis

- **Agapaki, E.** (2014). "Higher-order subgrade reaction models for piles and flexible walls", Diploma Thesis, University of Patras, Greece (in Greek with English Abstract)

4. HONORS

4.1 Scholarships

- *Sept 2018:* **Charles M. Vest Scholarship** for on National Academy of Engineering Grand Challenge to "Restore and Improve Infrastructure"
- *Oct 2016:* **International Doctoral Scholar Award** (EPSRC-Cambridge)
- *Oct 2016:* Studentship Award by **AVEVA Group Plc.**
- *Sept 2014, 2015:* **UCLA Graduate** Division Fellowship Award
- *Nov 2013, Sept 2012:* Honorary Scholarship from the **State Scholarships Foundation of Greece (IKY)** due to superior academic performance (ranked 2nd among approximately 200 students).

4.2 Awards

- *Feb 2018:* Finalist of the **Cambridge Society for the Application of Research** (CSAR) Student Awards
- *Oct 2017*: Selected among 100 women to solve **Amazon's "Think Big Challenge"** at the University of Cambridge (Team Leader for Amazon Robotics Aid Challenge)
- *Sept 2017*: Award from **Technical Chamber of Greece** for academic performance in her studies during the years 2009-2014
- *July 2017*: **1st prize** at **International Innovation Competition** (Lean & Computing in Construction Congress
- *March 2017*: **Best "Rising" Star Poster Award** at **4th Oxbridge Women in Computer Science** Conference at Oxford, U.K.
- *May 2015*: **UCLA Outstanding Geotechnical Graduate Student Award**
- *August 2012:* Selected among 400 international applicants to attend with other 42 students, the **FCE Summer School for Outstanding Postgraduate** and Senior Undergraduate Students in **Hong Kong Polytechnic University**
- *April 2008:* Joined a team of Greek students, assembled based on college's grades, in an academic trip to **CERN's particle accelerator in Switzerland**
- *November 2008:* Selected, due to superior high school grades, among Greek high school students to participate in the program "Youth are getting to Know Europe" in Brussels, organized by the **General Secretariat of Youth in Greece**

- *2004-2009:* Various scholastic and music awards, including participation in **Hellenic Mathematic Society competitions** (Thales & Euclid).

5. TEACHING EXPERIENCE

Demonstrator – University of Cambridge

Part IA-LEGO Mindstroms *(Michaelmas 2016)*

- Assisted groups of students (~100) to design, build and control an engineering system based on a number of sensors and actuators
- Course length: 2 weeks (8 hours in total)
- Guided the students through their class project and group presentations

Part IA-Structural Design Course *(Lent 2017)*

- Assisted groups of undergraduate students (~50) to design, build and test a light-weight aluminum bridge truss with a span of about 1 m.
- Marked the students' individual reports
- Course length: 8 weeks

Part IIA-Constructionarium *(Lent 2017, 2018)*

- Assisting groups of undergraduate students (~35) to construct scaled down versions of Ravenspurn Oil Platform and Kingsgate Footbridge in collaboration with Laing O'Rourke and Ramboll in a short period of time (one week)
- Supervised the students' progress during a period of six months
- Marked the students' reports (Organization Charts, Risk assessments, Task Sheets, Gantt Charts, Cost Plans)

Part IIB-Construction Engineering *(Lent 2017)*

- Marked students' reports on Construction management economics
- Course length: 8 weeks

Teaching assistant - UCLA

- **CEE129L:** Engineering Geomatics *(Winter 2015, Winter 2016)*

  Assisting 3rd year undergraduate students (21 and 20 students respectively) in collection and processing of geospatial data, using advanced global positioning systems (GPS) for high-precision mapping, advanced laser-based light detection and ranging (LIDAR) mapping. Grading laboratory assignments.

- **CEE128L:** Soil Mechanics Lab *(Spring 2015)*

  Assisting groups of undergraduate students (~40) in laboratory experiments, including soil classification, grain size distribution, Atterberg limits, specific

gravity, compaction, expansion index, consolidation, shear strength determination. Grading laboratory reports.

6. RESEARCH EXPERIENCE

Department of Civil Engineering, University of Cambridge (September 2016 – Present)
RESEARCH IN PROGRESS

- *Automation of the generation of as-is geometric Building Information Models (BIM) of industrial facilities*
  - *Modelling of most important As-Is industrial object types*
  - *Detection of shapes in CLOI using deep learning methods that learn directly on point clouds*
  - *Semantic classification of the most important industrial objects*

Supervisor: Dr. Ioannis Brilakis
Advisor: Professor Duncan McFarlane

COMPLETED

- **University of California, Los Angeles**
  - "Development of validated methods for soil-structure interaction analysis for buried structures", Centrifuge experiment at UC Davis

Centrifuge modeling program designed to extend previous test results by applying a wider range of ground motions and shaking amplitudes and deploying a dense instrument configuration. Large scale centrifuge experimental work to simulate construction of culverts under earthquake loading.

  - "Residual Analysis of Hellenic Data relative to global ACR Ground Motion Prediction Equation (GMPE)"

Mixed effects residual analysis performed to evaluate the compatibility of Hellenic data with NGA-West2 models (Boore and others, abbreviated as BSSA14 GMPE)

- **University of Patras**
  - "Higher-Order Winkler Solutions for Flexible Piles and Walls"

A combination of high-order analytical models of the Vlasov- Leontiev/Pasternak type and finite-element analyses using PLAXIS. By matching the values of stiffness along the various degrees of freedom atop the pile, between the closed-form solution and the finite-element data, a back-calculation of multiple sets of coefficients of sub-grade reaction was obtained, which allows matching simultaneously peak displacements, rotations and moments along the pile.

9. INVITED TALKS

- *"Visualization of infrastructure using BIM",* **HELLASCO Conference, Thessaloniki,** September 2017 (invited guest speaker) (https://www.erasmus.gr/microsites/1120/eva-agapaki)

- *"Automated as-is modelling of industrial facilities",* **Darwin College Science Lunchtime Seminar Series**, February 2018.
- *"Automated 3D modelling of existing in industrial facilities",* **5th Oxbridge Women in Computer Science Conference, Cambridge,** March 2018.
- *"Automated as-is modelling of industrial facilities",* **Laboratory for Information and Decision Systems (LIDS) tea talk, MIT,** September 2018.
- "Automated as-is modelling of existing industrial facilities", **MIT Computer Graphics Annual Retreat 2018**, MIT Endicott House, November 2018.
- "Automated as-is modelling of existing industrial facilities – segmentation and classification methods", **NYU,** November 2018.

7. JOURNAL REVIEWER

- **Advanced Engineering Informatics** (1 review)

8. UNIVERSITY SERVICE

- **Graduate Representative of the School of Technology Council** in Cambridge (1 January – 31 December 2018) – representing around 1,500 Graduate Students in the Department of Computer Science, Department of Engineering, the Judge Business School, Chemical Engineering and Biotechnology, Cambridge Institute for Sustainability Leadership (https://www.tech.cam.ac.uk/Graduate/aboutgrad)
- Nominated **Student Representative** of the **Academic Standards and Enhancement Committee at the University of Cambridge** (November 2018)

9. CONFERENCE SESSION MODERATOR/ORGANIZER

- **Graduate Engineering Conference**, "Shape the Future", University of Cambridge, St. John's College, keynote speaker: Tristram Carfrae (Deputy Chairman and ARUP Fellow), 13th July 2018, Cambridge, U.K.
- **Chair of "Design Automation" Session**, 17th International Conference on Computing in Civil and Building Engineering (ICCCBE), 5-7 June 2018, Tampere, Finland.

10. TECHNICAL SKILLS

Programming Languages: C#/C++, Python, R, Fortran
Algorithm Development Environments: Matlab, Visual Studio
Software Packages: Wolfram Mathematica, MathCAD, MiniTab, SAP2000, AutoCAD, Primavera, Maptek I-Site Studio, FLAC 2D, PLAXIS, RAM, PERFORM 3D, RS^2 (Rocscience), Slide (Rocscience), LPILE, LabVIEW, MS-Project, Revit (Autodesk), LFM Modeller

11. PROFESSIONAL CERTIFICATION

Machine Learning Certificate	Coursera (Stanford)	August 2016
Advanced C# Programming	London Academy of IT	July 2017

12. WORK EXPERIENCE

- *Jul 2011 – Aug 2011,* Intern, J & P AVAX, Heraklion, Crete, Greece.

Visited construction sites and studied designs of viaducts and tunnels belonging to Saint-Barbara and Mires highway (budget around $130 million). Studied construction management aspects of the construction site

Address: Amarousiou-Chalandriou 16, Athens, Greece
Tel: +30210-6375000
Supervisor: Ilias Fradelos, P.E.

- *Jul 2012 – Aug 2012*, Intern, Domiki Kritis S.A., Heraklion, Crete, Greece
  Prepared Technical Road Construction studies
  Address: Koronaiou 14, 71202, Heraklion, Crete, Greece
  Tel: +302810-288287
  Supervisor: George Synatsakis, P.E.

13. OTHER DIPLOMAS

Piano Diploma of Teaching (12 years of practice), recognized by the Ministry of Culture and Tourism of Greece (Grade 10/10, June 2010)

14. PRESS/MEDIA

Articles

- **ASCE Civil Engineering Magazine: "The New Reality",** Contribution in the article http://www.tabpi.org/2018/tah2.pdf
- **CORDIS: "Generating as-is 3D models of existing infrastructure",** Contribution in the article: https://cordis.europa.eu/result/rcn/222398_en.html

Interviews

- **Greek National Television (SKAI):** https://www.youtube.com/watch?v=1fFRr20XlV0
- **Greek National Television (ERT)** (speaking between 44' – 46'): https://webtv.ert.gr/ert1/stous-ichous-tou-bigk-ben/22apr2018-stoys-ichoys-toy-mpigk-mpen/

Media

- **LC3 Construction Innovation Competition Pitch:** https://www.youtube.com/watch?v=z0qSXj2AJ60
- **Laing O'Rourke Centre for Construction Engineering and Technology:** https://www.construction.cam.ac.uk/news/phd-student-eva-agapaki-wins-best-rising-star-poster
- **Construction Information Technology Laboratory:** https://cit.eng.cam.ac.uk/news/phd-student-eva-agapaki-wins-best-rising-star-poster
- **Greek press:** http://www.thetoc.gr/new-life/creatives/article/kritikia-foititria-tou-keimpritz-prwti-se-diagwnismo-kainotomias
- **Greek press:** https://www.alfavita.gr/epistimi/226140_diethnes-brabeio-kainotomias-gia-ereynitria-apo-tin-kriti

- **Greek press:** https://www.espressonews.gr/reportaz/2017/07/162865/pagkosmia-protia-gia-kritikopoyla
- **Greek press:** https://www.neoiorizontes.gr/kriti/16345-pagkosmia-protia-gia-kritikopoyla
- **Greek press:** https://www.inewsgr.com/184/apo-tin-kriti-sto-kebritz--i-kritikia-pou-kerdise-to-proto-vraveio-se-diagonismo-kainotomias-eikones.htm
- **Greek press:** https://dexiextrem.blogspot.com/2017/07/blog-post_996.html
- **Greek press:** https://www.cretalive.gr/science/apo-thn-krhth-sto-cambridge-kai-tis-spoydaies-diakriseis

15. SOCIETY MEMBERSHIP/OUTREACH

- **STEM (Sciences, Technology, Engineering and Mathematics) Ambassador** in U.K. (https://www.stem.org.uk)
- **Cambridge University Engineering Society** Presentations Officer (March 2017 – April 2018) (https://www.cues.org.uk)
- Student Member of **Cambridge Women in Computer Science** (https://www.cl.cam.ac.uk/women/) , IET (Institute of Engineering & Technology), Hackers are Cambridge, Institution of Structural Engineers, Cambridge Union, Cambridge University Engineering Society (CUES), American Society of Civil Engineers (ASCE), California's Consulting Geotechnical Engineers (CalGeo), Earthquake Engineering Research Institute (EERI), Deep Foundations Institute (DFI) & European Civil Engineering Education and Training (EUCEET)
- *Oct 2011:* president of the IEEE Power and Energy Society (PES) Chapter; responsibility to create a team of student members at the University of Patras (the Chapter is in development mode)

15. PERSONAL INFORMATION

Languages: English (fluent), French (intermediate), Greek (native) *Citizenship:* Greek

16. REFERENCES