

Doctoral Assistant at the Laboratory of "Earthquake Engineering and Structural Dynamics" (EESD)

École Polytechnique Fédérale de Lausanne (EPFL) | <https://people.epfl.ch/amir.rezaie>

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Google scholar: <https://scholar.google.com/citations?user=xAlJoP4AAAAJ&hl=en>

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Education

- 2017–Present **PhD in Structural Engineering.**
École Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland.
Title: Prediction of Drift and Force Capacity of Undamaged and Damaged Stone-masonry Walls
PhD supervisor: Prof. Katrin Beyer
Expected graduation date: 08/2021
- 2021 **CAS ETH in Computer Science (Visual Computing Track).**
ETH Zürich, Zürich, Switzerland.
- 2020 **Mirco Master in Data Science.**
University of California San Diego, California, USA.
(online)
- 2015–2017 **Master of Science in Structural Engineering.**
University of Tehran, Tehran, Iran
Title: Vibration Control of Structures Using Wave Barriers
GPA: 18.86/20
Graduation date: 07/2017
- 2011–2015 **Bachelor of Science in Civil Engineering.**
University of Tehran, Tehran, Iran
GPA: 18.86/20
Graduation date: 08/2015

Projects

Laboratory Experience

Experimental tests on rubble stone masonry walls.

Description:

- * Testing 6 large-scale stone masonry walls under quasi-static cyclic shear-compression loads.
- * Testing 6 masonry panels under compression and diagonal-compression loads.

Link to our publication: <https://doi.org/10.1016/j.conbuildmat.2020.118972>

Machine Learning and Computer Vision Related Projects

Crack segmentation.

Description:

Implementation of a deep convolutional neural network to segment crack pixels in images of walls.

Link to our publication: <https://doi.org/10.1016/j.conbuildmat.2020.120474>

Varroa mites bounding box detection, *Final project of the course Image analysis and pattern recognition [EE-451, EPFL]* , <https://edu.epfl.ch/coursebook/en/image-analysis-and-pattern-recognition-EE-451>.

Description:

Implementation of a deep convolutional neural network to detect varroa mites in images of beehive.

Our group was ranked first in the leaderboard [<https://eval.ai/web/challenges/challenge-page/321/leaderboard/971>].

Comparison of pair of MNIST digits, *Project of the course Deep learning [EE-559, EPFL]* , <https://edu.epfl.ch/coursebook/en/deep-learning-EE-559>.

Description:

This project aimed at developing a deep neural network to compare pairs of MNIST digits and to predict for each pair if the first digit is lesser or equal to the second.

You may see the implemented codes and report in the link below:

<https://github.com/amirrezaie1415/Deep-learning-course-projects-EPFL/tree/main/Proj1>.

Implementation of a Mini Deep Learning Framework in Python, *Project of the course Deep learning [EE-559, EPFL]* , <https://edu.epfl.ch/coursebook/en/deep-learning-EE-559>.

Description:

In this project, a new deep learning framework was developed capable of building fully-connected neural networks in Python language using Tensor operations of the PyTorch library.

You may see the implemented codes and report in the link below:

<https://github.com/amirrezaie1415/Deep-learning-course-projects-EPFL/tree/main/Proj2>.

Higgs Boson; To be, or Not to Be, *Project of the course Machine Learning [CS-433, EPFL]* , <https://edu.epfl.ch/coursebook/en/machine-learning-CS-433>.

Description:

Implementation of machine learning methods to detect the presence of Higgs Boson particles.

You may see the implemented codes and report in the link below:

https://github.com/amirrezaie1415/Machine-Learning-EPFL_project_1. Our group, with the participant ID our_team, was ranked 20th out of 269 groups in the leaderboard https://www.aicrowd.com/challenges/epfl-machine-learning-higgs/leaderboards?challenge_round_id=78.

Supervision Experience

- 2020 Semester project (EPFL) | Mr. Remy Dornier | Title: Development of an Image Analysis Algorithm for Crack Detection in Walls
- 2018 Master thesis (EPFL) | Mr. Antoine Mauron | Title: Predicting the Change in Natural Period of Building due to Damage

Teaching Experience

- 2018 Mathématiques 1 and Mathématiques 2, Le cours de mise à niveau (MAN) Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
- 2016 Loading, Professor Seyed Mehdi Zahrai, School of Civil Engineering, University of Tehran, Tehran, Iran
- 2014 Highway Engineering, Professor Massoud Palassi School of Civil Engineering, University of Tehran, Tehran, Iran
- 2012–2013 Computer Programming, Professor Shahram Vahdani School of Civil Engineering, University of Tehran, Tehran, Iran

Honors and Awards

- 2017 **FOE Award-1st Rank.**
Achieving the highest GPA (Master degree) among master students in the Civil Engineering department.
- 2015–2017 **Iran's National Elites Foundation (INEF) Fellowship.**
INEF is a national organization supports Iranian talents.

- 2015 **EPFL Excellence Fellowship.**
Selected to receive EPFL Excellence Fellowship for civil engineering master program.
- 2015 **FOE Award-1st Rank.**
Achieving the highest GPA (Bachelor degree) among bachelor students in the Civil Engineering department.
- 2014 **FOE Award-1st Rank.**
Achieving the Faculty of Engineering (FOE) award, which is granted to the top 3 one year academic GPA.
- 2013 **FOE Award-2nd Rank.**
Achieving the Faculty of Engineering (FOE) award, which is granted to the top 3 one year academic GPA.
- 2012 **FOE Award-3rd Rank.**
Achieving the Faculty of Engineering (FOE) award, which is granted to the top 3 one year academic GPA.

Research Output List

Peer-reviewed publications in international scientific journals.

- **Rezaie Amir**, Godio M, Beyer K. Damage Assessment of Stone Masonry Walls by Machine Learning. Construction and Building Materials. (under preparation)
- **Rezaie Amir**, Achanta R, Godio M, Beyer K. Comparison of Crack Segmentation Using Digital Image Correlation Measurements and Deep Learning. Construction and Building Materials. **2020** Nov 20;261:120474.
- **Rezaie Amir**, Mauron AJ, Beyer K. Sensitivity analysis of fractal dimensions of crack maps on concrete and masonry walls. Automation in Construction. **2020** Sep 1;117:103258.
- **Rezaie Amir**, Godio M, Beyer K. Experimental investigation of strength, stiffness and drift capacity of rubble stone masonry walls. Construction and Building Materials. **2020** Aug 10;251:118972.
- Dolatshahi KM, **Rezaie Amir**, Rafiee-Dehkharghani R. Topology optimization of wave barriers for mitigation of vertical component of seismic ground motions. Journal of Earthquake Engineering. **2020** Jan 2;24(1):84-108.
- **Rezaie Amir**, Rafiee-Dehkharghani R, Dolatshahi KM, Mirghaderi SR. Soil-buried wave barriers for vibration control of structures subjected to vertically incident shear waves. Soil Dynamics and Earthquake Engineering. **2018** Jun 1;109:312-23.

Peer-reviewed conference papers.

- **Rezaie Amir**, Mauron A, Dolatshahi KM, Beyer K. Fractal and complexity analysis of crack patterns of masonry walls. 16th European Conference on Earthquake Engineering, **2018**, Thessaloniki, Greece.

Certificates – Online Learning

- 2020 **Natural Language Processing with Classification and Vector Spaces.**
Issuing Organization: Deeplearning.ai
Credential URL: <https://coursera.org/share/265433ad06dd8c81574596162dd88425>
- 2020 **Natural Language Processing with Probabilistic Models.**
Issuing Organization: Deeplearning.ai
Credential URL: <https://coursera.org/share/a4639ef49cf3d30cd0b1e2367e0124e2>
- 2020 **Natural Language Processing with Sequence Models.**
Issuing Organization: Deeplearning.ai
Credential URL: <https://coursera.org/share/1339c3653ef4111b7ee64e2d5a90a6da>
- 2020 **Sequence Models.**
Issuing Organization: Deeplearning.ai
Credential URL: <https://coursera.org/share/b25a13ee5107796977de11b72248340c>
- 2018 **Statistical Thinking for Data Science and Analytics.**
Issuing Organization: ColumbiaX [edx]
Credential URL: <https://courses.edx.org/certificates/5305b62fde70470386417cc8466ff88a>

2018 **Introduction to Python for Data Science.**

Issuing Organization: Microsoft [edx]

Credential URL: <https://courses.edx.org/certificates/ffa270c1ddbd439186d7db002ca36f60>



Skills

Programming.

Python

MATLAB

R

Languages.

Persian: Native

English: Professional working proficiency

French: Limited working proficiency

German: Elementary proficiency

Relevé des résultats (26.10.2020) pour / Statement of results (26.10.2020) for

Rezaie Amir

Thesis

Programme doctoral : Génie civil & environnement

Doctoral program: Civil & Environmental Engineering

Matricule fédéral : 15-803-661

Federal number

Matières	Forme Forms	Langue enseign. Teaching Language	Session	Note ou (moyenne) Grade or (average)	Crédits ou (Coeff) Credits or (Coeff)	Crédits obtenus Obtained credits
Thesis						
Program courses					12	21
Other doctoral courses (EDOC)						4
Data Analysis for Science and Engineering	MULTI	EN	08.2018	R Passed	4	4
Master courses						15
Deep learning	E	EN	09.2020	5.75	4	4
Image analysis and pattern recognition	PS	EN	07.2019	6	4	4
Machine learning	E	EN	02.2020	6	7	7
Transferable skills						2
Academic Writing for Doctoral Students (1)	O	EN	03.2018	4.5	2	2

Remarques :

- Il se peut que des crédits et des moyennes ne soient pas calculés en fonction de la date d'impression du relevé de notes.
- Les notes et décisions sont masquées durant la période des examens. Les notes redeviennent visibles à la fin de la session d'examens et sont définitivement confirmées durant la Conférence des Examens, suite à laquelle les décisions apparaîtront.
- Seul le bulletin original imprimé sur du papier blanc avec un filigrane central et signé par le Vice-Président pour les Affaires Académiques fournit les résultats définitifs.
- Formes d'examens : E=écrit, O=oral, PS=pendant le semestre, EO=écrit & oral, MULTI=multiple, M=mémoire, EX=exposé, TP=rapport de TP, ECH=hors plans
- Les branches sont notées de 1 à 6, la meilleure note étant 6. Une note en dessous de 4 sanctionne une prestation insuffisante. Les 1/4 de points sont admis. Lorsque la note de la branche est inférieure à 1 ou pour absence non justifiée, la branche est considérée comme non acquise et notée NA. La lettre D correspond à la dispense d'une épreuve. Les lettres R ou E correspondent à la réussite ou à l'échec d'une branche pour laquelle un résultat n'est pas fourni. Un M correspond à une absence justifiée.

Remarks:

- It is possible that some credits and averages have not been calculated at the time this statement was printed.
- Marks of an exam session remain hidden until the end of the session and official decisions will only appear once the Conference for ratification of examination results has taken place and confirmed all results.
- Only the original mark sheet printed on white paper with central pale pink impression and signed by the Vice-President for Academic Affairs, is considered as the final result.
- Examination forms : E=written, O=oral, PS=during the semester, EO=written & oral, MULTI=multiple, M=term paper, EX=oral presentation, TP=project report, ECH=out of study plan
- Subjects are graded from 1 to 6, 6 being the highest grade. A grade below 4 indicates a fail. Quarter points are allowed. When the grade for a subject is below 1 or in case of non-attendance without valid justification, the subject is considered not acquired and graded NA. Letter D indicates an exemption ("dispense"). Letters R and E indicate a pass (R for "réussite") or fail (E for "échec") for subjects for which no grade is provided. M indicates non-attendance with valid justification.

Voir les remarques présentes à la fin du relevé / *Please read the remarks at the end of this statements of results*
Suisse, Lausanne, le 26 octobre 2020 / *Switzerland, Lausanne, 26th october 2020*