

## Education

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### Heriot-Watt University

Oct 2019 – June 2023 (Submission Expected)

*PhD Candidate in Civil Engineering (James Watt Scholarship)*

*Edinburgh, United Kingdom*

- Advisors: Dr Sandhya Patidar and Prof David Jenkins
- Thesis: Developing a hybrid system of data-centric approaches for energy demand analytics.

### University of Tehran

Oct 2015 – Oct 2018

*MSc in Engineering Geology (With Distinction)*

*Tehran, Iran*

- Advisors: Dr Jafar Hassanpour and Dr Akbar Cheshomi
- Dissertation: Evaluating interaction of underground excavations and groundwater resources based on experiences gained from long water conveyance tunnelling projects in Iran.

### University of Tehran

Mar 2011 – Oct 2015

*BSc in Geology*

*Tehran, Iran*

## Experience

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### Heriot-Watt University

Sept 2021 – Present

*Research Assistant*

*Edinburgh, United Kingdom*

- Working on three different projects since Sept 2021 with various partners in Heriot-Watt University.
- **Project 1:** Conducting a technical review on energy efficiency and climate resilience opportunities of UK homes for PropEco.
- **Project 2:** Worked for four months on a hydrology project in collaboration with Indian Institute of Technology, Roorkee on developing a riverflow forecasting system. Developing a daily and weekly riverflow forecasting model for River Dee in Aberdeenshire, Scotland using a Gradient Boosting Regression algorithm.
- **Project 3:** Currently working on a project with the Data Lab.

### Siemens AG (Research Project)

May 2022 – Nov 2022

*Researcher (Part-time)*

*London, United Kingdom*

- Developing a deep neural network based approach for rolling bearing fault diagnosis of high speed trains.
- Investigating effectiveness of various pre-processing methods (i.e. FFT and WT) on vibration measurements in improving the model classification accuracy.
- Outcome: launching a transfer learning framework to diagnose bearing fault of unlabelled acoustic datasets.

### Samsung

Jun 2017 – Sep 2019

*Senior Data Analyst*

*Tehran, Iran*

- Developed and reviewed business KPI's and analysing data.
- Developed and implemented databases, data collection systems.
- Developed market oriented interactive dashboards in Power BI and Excel.
- Prepared reports based on country-wide surveys (Price Monitoring, Customer Behaviour, and Products Availability)

### University of Tehran

Oct 2016 – May 2017

*Teaching Assistant*

*Tehran, Iran*

- Performed academic tutoring in Engineering Geology course under the supervision of Dr Hassanpour.
- Delivered a variety of teaching and assessment activities, including seminars and tutorials.
- Participated in the assessment process utilising a range of techniques, and provided students with effective, and relevant feedback to enhance their learning.

## Publications

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- [1] Kaitai Dong; **Ashkan Lotfipoor**; "Intelligent Bearing Fault Diagnosis Based on Feature Fusion of One-Dimensional Dilated CNN and Multi-Domain Signal Processing". In: *Engineering Applications of Artificial Intelligence [Under Review]* (2023).
- [2] **Ashkan Lotfipoor**; Sandhya Patidar; David Jenkins. "CNN-LSTM Network with Empirical Mode Decomposition and Bayesian Optimisation for Residential Load Forecasting". In: *Expert Systems With Applications [Under Review]* (2023).
- [3] **Ashkan Lotfipoor**; Sandhya Patidar; David Jenkins. "Data Imputation in Residential Building Energy Demand Based on Transformer". In: *Energy [Under Review]* (2023).

- [4] Jafar Hassanpour; **Ashkan Lotfipoor**; Massoud Morsali. “Introduction of an empirical classification system for evaluating tunneling impact on the discharge of springs (TIS) in the surrounding areas”. In: *Bulletin of Engineering Geology and the Environment* (2021). ISSN: 1435-9537. URL: <https://doi.org/10.1007/s10064-021-02268-5>.
- [5] **Ashkan Lotfipoor**; Sandhya Patidar; David Jenkins. “Short-term Forecasting of Residential Electricity Demand Using CNN-LSTM”. In: *2nd IBPSA-Scotland uSIM Conference*. Edinburgh, 2020.
- [6] **Ashkan Lotfipoor**; Jafar Hassanpour; Akbar Cheshomi; Masoud Morsali. “Evaluating the Risk of Springs Drawdown in Kerman Water Conveyance Tunnel”. In: *36th National Geosciences Symposium*. Tehran, 2018.
- [7] **Ashkan Lotfipoor**; Jafar Hassanpour; Akbar Cheshomi; Masoud Morsali. “Determination of the effect of tunnel boring activities on Sarab-Garm spring drawdown in Bazi-Deraz water conveyance tunnel”. In: *35th National Geosciences Symposium*. Tehran, 2017.
- [8] **Ashkan Lotfipoor**; Jafar Hassanpour; Akbar Cheshomi; Masoud Morsali. “Development of a Program for Probabilistic Analysis of Water inflow into Tunnels”. In: *12th Iranian and 3rd Regional Tunneling Conference*. Tehran, 2017.

## Invited Talks

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- Heriot-Watt University IEE Seminar** | *Edinburgh, Scotland* **April 21th, 2021**
- Application of Machine Learning Approaches for Energy Demand Analytics.
- Iranian Tunnels Association Monthly Speeches** | *Tehran, Iran* **August 15th, 2018**
- Introducing an Empirical Methodology for Evaluation of Tunnelling Impacts on Water Resources.
- Iranian Tunnels Association Monthly Speeches** | *Tehran, Iran* **January 25th, 2017**
- Probabilistic Analysis of Water Inflow Into Tunnels.

## Presentation

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- 8th International Conference on Time Series and Forecasting** | *Gran Canaria, Spain* **June 29th, 2022**
- CNN-LSTM Network with Empirical Mode Decomposition and Bayesian Optimisation for Residential Load Forecasting.
- EGIS Symposium 2021 - Innovations That Inspires** | *Edinburgh, United Kingdom* **May 6th, 2021**
- Machine Learning Based System for Missing Data Imputation and Energy Demand Forecasting.
- 2nd IBPSA-Scotland uSIM Conference** | *Edinburgh, Scotland* **November 12th, 2020**
- Short-term Forecasting of Residential Electricity Demand Using CNN-LSTM.
- 12th Iranian and 3rd Regional Tunnelling Conference** | *Tehran, Iran* **February 22th, 2017**
- Development of a Program for Probabilistic Analysis of Water inflow into Tunnels

## Technical Skills

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**Deep Learning:** Convolutional networks, Sequence models, Transformers

**Machine Learning:** Time series forecasting, Ensemble methods, Regression and Classification, Clustering algorithms

**Data Analysis:** Data visualisation, Statistical modelling, Explanatory analysis, Power BI, VBA

**Programming:** Python, SQL, JavaScript, HTML/CSS, GIT, Bash

**Python Libraries:** TensorFlow (in Python and JS), Keras, Sklearn, Pandas, Numpy, Matplotlib, Seaborn, Plotly