

# Arian Maghsoudnia

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## Personal Profile

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I am a second-year Energy engineering student in Politecnico di Milano, seeking an entry-level position in the sustainable energy technology traineeship program. Due to the high academic demands of exams, assignments, and intensive research during my degree, I have acquired a perfect hard-working spirit and thus, I am also able to work under pressure, meticulously. Over the past years, I have also had a position of researcher in Thermodynamic and Energy-Conversion Lab, proving that I can potentially surpass so many students within a professional field of working with software like Fluent, C++, SolidWorks, and Matlab. More importantly, I have become adept in modeling and analytical solving as well as experimental testing and programming in the field of optimization. I have also had a good performance during advanced math I took in Polimi, mainly regarding the numerical optimization and modeling. I am looking for a challenging position where I can assess my ideas which can further be used for practical purposes so I can play my role in obviating the global concern over energy demands and its sustainability and cleanliness.

## Education

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### September 2018 – Present

M.Sc. in Energy Engineering  
Politecnico di Milano

### September 2013 – March 2018

B.Sc. in Mechanical Engineering  
Amirkabir University of Technology (Tehran Polytechnic)

#### Grade achieved:

- ❖ Bachelor Degree's Cumulative GPA  
16.51/20
- ❖ GRE Quantitative Reasoning  
165/170

## Selected Courses

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|--|---|--|--|
| • Bioenergy and Waste-To-Energy Technologies | • Renewable Energy and Low-Carbon Technologies    | • Energy and Environmental Technologies for Building Systems | • Industrial Ecology                         |
| • Advanced Mathematical Methods              | • Smart Grids and Regulation for Renewable Energy | • Renewable Energy and Low-Carbon Technologies               | • Fluid Machines for Low-Carbon Technologies |

- Air Pollution and Control System
- Electrical Conversion of Renewable Energy Sources
- Fundamentals of Chemical Processes for Energy and Environment
- Energy Systems

## Language Proficiency

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### English

- ❖ TOEFL IBT : 110 (R:30 L:27 S:27 W:26)
- ❖ GRE: 148 in Verbal Reasoning

### Italian

- ❖ A2 Certificate, European Framework of Reference

### German

- ❖ A1 course in Iran Language Institute

### Persian

- ❖ Native Language

## Research Interest

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- ❖ Waste Management
- ❖ Air Pollution Control
- ❖ Life Cycle Assessment
- ❖ Data Science & Big Data
- ❖ Numerical Optimization and Modelling
- ❖ Objective Programming

## Work Experience

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**January 2018 – July 2018**

### Position

- ❖ Researcher

### Supervisor

- ❖ Dr. Reza Nadafi

### Location

- ❖ Entrepreneurship and Innovation Center, Amirkabir University of Technology

Main duties performed:

- 1- Thermal calculations in an HRSG powerplant's stack using FLUENT solver and analytical solution verification. Due to the need for designing a thermoelectric dew point detector in the stack of power plants, thermal calculations should be carefully done to find out the efficacy of the designed sensor. The ability to use Thermal Conductive Detectors are also investigated in this project.

**December 2017 – August 2018****Position**

- ❖ English Teacher

**Supervisor**

- ❖ Farshid Lavasani

**Location**

- ❖ Iranmehr Language Institute

**August 2017 – January 2018****Position**

- ❖ Researcher

**Supervisor**

- ❖ Dr. Saman Paria

**Location**

- ❖ Energy Conversion and Thermodynamics labs, Mechanical Engineering Department, Tehran Polytechnic

Main duties performed:

- 2- Conceptual design of energy-efficient house using regenerative cycle adjusted for Iran's weather, experimental testing and validation is the next objective.
- 3- Optimizing single-crystal PV panels using selective filters. The automated system of logging for calculating the maximum power point has been designed which can further be promoted to a tracking system. Also, the effect of using commercial low emission films has been experimentally tested. Further increasing the efficiency and cooperation with the chemical engineering department to make filters ourselves is the next objective.

**January 2015 – January 2016****Position**

- ❖ Leader of the Industrial Connection Committee
- ❖ Leader of the Informatics Committee

**Location**

- ❖ Scientific Association of Mechanical Engineering Department, Tehran Polytechnic

Main duties performed:

I was in charge of a group that had the goal to establish connections between the university and industrial investigators. In this regard, we would collect ideas from students and tried to find proper industries in which they could commercialize their design. Moreover, multiple visits from renowned industrial regions had been coordinated for students so they could acquire greater insight.

As the Informatics committee leader, I managed a project to gather a comprehensive, categorized database of books and software that can be used productively for years.

**Jan 2015 – May 2015****Position**

- ❖ The conductor of Solid Mechanics Seminars, ISME 2015

**Location**

- ❖ Mechanical Engineering Department, Tehran Polytechnic
- ❖ Main duties performed:

Iran society of mechanical engineering holds its annual seminar in one major university where Tehran Polytechnic was responsible for the 2015 sessions. My team worked on conducting and coordinating solid mechanic presentations from authors whose articles were admitted to the conference.

**Jun 2015 – October 2015**

**Position**

- ❖ Intern

**Location**

- ❖ Saipa Automotive Manufacturing Group

Main duties performed:

As an intern, I visited multiple assembly and manufacturing sites, mostly when the group wanted to test a new product to be installed on their products. Besides, I was asked to organize one of the automatic purchasing systems so they could save money by excluding unnecessary items from an automatic system.

## Teaching Experience

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**January 2015 – June 2016**

**Position**

- ❖ Teaching Assistant

**Location**

- ❖ Mechanical Engineering Department, Tehran Polytechnic

Main duties performed:

For the CFD course, coding in C++ was required for which I compiled materials and taught for the course; the experience was significantly important as I taught students to both use basic C programming syntaxes as well as writing and using main solving codes – TDMA, Gauss-Seidl, and Crank-Nicolson to name a few.

## Honors and Awards

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**Honor**

- ❖ Gold (Merit) Full Scholarship

**Issuer**

- ❖ Politecnico di Milano

**Description**

For the year 2018, I was granted the full scholarship for my previous achievements during my bachelor's and also my GRE. For the year 2019, I was awarded again for my achievements regarding the number of credits and grades in my first year in Polimi.

### **Honor**

- ❖ **Ranked First among Scientific Associations, AUT**
- ❖ **Ranked First for “Ofoq” Scientific Magazine, AUT**

### **Issuer**

- ❖ Scientific Student Associations of Amirkabir University of Technology

### **Description**

Due to the standardized grading system of the Scientific Student Associations of Amirkabir University of Technology (SAO), one scientific association, and one publication is chosen as the best one in the overall ranking. The scientific association of mechanical engineering department was selected by this organization for the overall performance of the year 2016. “Ofoq”, the scientific quarterly magazine of scientific associations of the mechanical engineering department was also chosen as the first rank.

### **Honor**

- ❖ **Ranked Third for “Ofoq” Scientific Magazine**

### **Issuer**

- ❖ Ministry of Science, Research, and Technology of Iran

### **Description**

"Harekatfest" (in Persian Jashnvare-ye-Melli-e-Harekat) is annually held by the Ministry of Science, Research and Technology of Iran to determine the most successful scientific associations. “Ofoq” magazine was selected as the third best scientific magazine of the year by this organization in the year 2016.

### **Honor**

- ❖ **Ranked Top 1% in the National Entrance Examination form Iranian universities**

### **Issuer**

- ❖ Educational Testing Organization of Iran

### **Description**

Ranked 727 among approximately 250,000 participants in the National Entrance Examination form Iranian universities, Iran. 2013

### **Honor**

- ❖ **Ranked First among all project, 27<sup>th</sup> NODET Exhibition**

### **Issuer**

- ❖ National Organization for Developing Exceptional Talents

### **Description**

A pilot of the paper-recycling factory was designed and built by our team member which enabled us to recycle a considerable amount of school wasted paper every year. The project was selected as the best project and was sent to the national contest of innovative ideas.

## **Projects**

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### **Time-Related Behaviour of Electricity and Gas Consumption of Lawrence Berkeley National Laboratory**

Dec 2019 –Feb 2020

### **Description**

The meteorological data of the LBNL-74 building is gathered. Using multiple sensors the data provided by the lab. Time-related features are guessed and added and then using

data-driven methods of Cross-validation, Random Forrest and online learning methods, the co-relation of gas and electricity consumption and the seasonal variation in consumption is predicted and verified by real data. The project is done using google collaboratory and Python 3 and is openly accessible in GitHub:

[https://github.com/arianmaghsoudnia/LBNL74\\_building\\_behaviour](https://github.com/arianmaghsoudnia/LBNL74_building_behaviour)

### **Case Study of a Two-story Office Energy Consumption and Losses in OpenStudio**

Feb 2020 –Feb 2020

#### **Description**

The Building is modeled in Sketchup and solved in OpenStudio for three different cities, two window glass types, three wall settings, and building dispositions.

### **Electricity and CO2 Emission Bidding Modelling in TU Delft Market Game Platform**

May 2019 –July 2019

#### **Description**

Extensive equations are derived to calculate the final bidding price for electricity and greenhouse gas allowance in a competitive market. Economic analysis is performed to assess the potential of revamping the plants or constructing new ones or even shutting down the old ones. The model was tested for 20 years.

### **Simplified Model of a Gas Turbine in Aspen Plus Environment**

June 2019 –June 2019

#### **Description**

The system was modeled without Cooling and then modified to consider the effects of intercooling and regeneration on efficiency, and specific work. Sensitivity analysis was also done in the end.

### **Removal of Acid Gasses from Natural Gas Sources**

Dec 2018 –Dec 2018

#### **Description**

A paper review of different chemical absorbing methods and physical absorption methods and technologies.

### **Optimizing Single Crystal PV Panels Using Low Emission Films**

Apr 2017 – Sep 2018

#### **Description**

Thesis Project

### **Conceptual Design of Full Load Power Plant Energy Storage System**

May 2017

#### **Description**

In this project, a combined system of flywheels and hydraulic water-driven storage units was designed to save energy, so power plants can work on its full load even when demands are low. Additionally, economic and technical feasibility studies were performed for the design.

### **Design of Leveller Orifice to Provide Equal Mass Flow Rate in Boiler Risers**

May 2017

#### **Description**

In this project, a code was written to find the arrangement of orifices as well as their inner and outer diameter which can provide equal mass flow-rate in all riser tubes, including all of the losses from downcomers, risers, and drums.

### **Design of a 6-Speed Gearbox**

Dec 2016 – Jan 2017

#### **Description**

Conceptual design of a multi-speed gear-box, including basic design of gears, strength and fatigue analysis of the gears and choosing belts and bearings were included. Calculations led to optimal gear modules and shaft material selection as well as finding the best force-exertion method.

### **Multiple-pane Windows Heat Transfer Analysis**

Apr 2016 – May 2016

#### **Description**

Many factors including air circulation around the window, the amount to which the gap between the windows has been vacuumed and the shape of gaps and the distance between the panes can play important roles in the total heat transfer of multiple pane windows. This project uses a commercial CFD code to determine the most efficient tilting angle of the windows and also the optimum distance between the panes.

### **Delta 3D Printer Strength Analysis**

Jan 2016 – Jan 2016

#### **Description**

A 3D delta printer has been re-designed and the fatigue analysis of the joints and nozzles done using ANSYS fatigue tools. Since the static load in this kind of printers is not the determinant factor in the failure of printers, fatigue failures are the dominant cause of this phenomenon. These calculations can be used for further reinforcement of weak points.

## **Licenses and Certificates**

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- ❖ Outstanding Performance in American English TTC Course, by Iranmehr Institute
- ❖ The license of ANSYS Structural training course by Scientific Association of Mechanical Engineering Department, Tehran Polytechnic
- ❖ The license of ANSYS Fluent training course by Scientific Association of Mechanical Engineering Department, Tehran Polytechnic
- ❖ Certificate of participation & completion of Green buildings seminar, focusing on LEED standard system explanation, University of Tehran Polytechnic
- ❖ Certificate of participation & completion of Body in White workshop, focusing on parametric design, University of Tehran Polytechnic