

## Ali Amini

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**Date of Birth:** December 14<sup>th</sup>, 1990

**Gender:** Male

**City of Birth:** Tehran, Iran

**Marital Status:** Married

## Education

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**Ph.D. candidate in Mechanical Engineering** / École Polytechnique Fédérale de Lausanne, Switzerland (2016-2019 expected)

- **Title of Ph.D. Thesis:** Effects of Different Parameters on Tip Vortex Cavitation

**Certificate of one-year MBA courses**, College of Engineering at University of Tehran, Iran (2015-2016)

**M.Sc. in Mechanical Engineering, Energy Conversion (Thermo-Fluid)** / University of Tehran, Tehran, Iran (2013-2015)

- Total GPA: 19.18 / 20
- Ranked 1<sup>st</sup>
- **Title of M.Sc. Thesis:** Effects of a Fluid's Non-Newtonian Behavior on Flow in Collapsible Tubes (Grade: 19.5 / 20)

**B.Sc. in Mechanical Engineering**/ University of Tehran, Tehran, Iran (2009-2013)

- Overall GPA: 18.75 / 20
- Ranked 4<sup>th</sup>
- **Title of B.Sc. Thesis:** One Dimensional Modeling of Blood Flow in Large Arteries (Grade: 20 / 20)

**High School Diploma in Physics and Mathematics**/ Emami High School, Tehran, Iran

- Overall GPA: 19.90/20
- Ranked 1<sup>st</sup>

## Research Interests

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Cavitation and Bubble Dynamics

Numerical and Experimental Fluid Flow

Turbulent Flow

Renewable Energy

Fluid-structure Interactions

Thermo-economic Optimization

Cardiovascular Flow

## Publications

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### Books

- **Book Chapter:** Mohammad Kazem Besharati Givi, Parviz Asadi, *Advances in Friction Stir Welding and Processing*, Woodhead publishing, Elsevier, 2014.  
Chapter 15: **Ali Amini**, P. Asadi, P. Zolghadr, *Applications of Friction Stir Welding in Industry*.
- A. Noorbakhsh, S. Azade, **A. Amini**, *Applications of Small Hydraulic Machines in Renewable Energy*, being written under a contract with Springer.
- **Co-editor** of book, *Statics*, Prof M. H. Naei, Published by Pooran-Pazhuhesh, 2012 (in Persian).

## Journal Papers

- **Ali Amini**, Nima Mirkhani, Pedram Pakjesm Pourfard, Mehdi Ashjaee, Mohammad Amin Khodkar, Thermo-economic optimization of low-grade waste heat recovery in Yazd combined cycle power plant (Iran) by a CO<sub>2</sub> transcritical Rankine cycle, *Energy* 2015;86:74-84.
- Nima Mirkhani, **Ali Amini**, Mehdi Ashjaee, A Comprehensive Thermo-economic Study on the Effects of Adding Reheat Process to CO<sub>2</sub> Transcritical Rankine Cycle for Low Grade Heat Applications, *Applied Energy* 2016 (Under Review).
- Kayvan Sadeghy, **Ali Amini**, Amirsaman Eghtesad, Creeping Flow of Herschel-Bulkley Fluids in Collapsible Channels: A Numerical Study, (Accepted to *Korea-Australia Rheology Journal*, 2016).
- P. Hanafizadeh, J. Eshraghi, **A. Amini**, "Entropy Analysis of Buoyancy Driven Gas-Liquid Two Phase Flow: Analytical and Experimental Approaches", *European Journal of Mechanics - B/Fluids* 2016;59:169-176.
- J. Eshraghi, **A. Amini**, P. Hadikhani, E. Kosari, P. Hanafizadeh, "Gas Properties Effect on Bubble Characteristics", *Chemical Engineering Communication* (Under Review since April 2015).

## Conference Papers

- J., Eshraghi, E. Kosari, P. Hadikhani, **A. Amini**, M. Ashjaee, and P. Hanafizadeh. "Numerical study of surface tension effects on bubble detachment in a submerged needle." *WIT Transactions on Engineering Sciences* 89 (2015): 77-86.

## Honors and Awards

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<b>Ranked 2<sup>nd</sup> in 18<sup>th</sup> Iran's National Olympiad</b> of Mechanical Engineering	2013
<b>Ranked 1<sup>st</sup> in M.Sc.</b> in Mechanical Engineering, University of Tehran	2015
<b>Ranked 3<sup>rd</sup> in the 2<sup>nd</sup> Year</b> at the Faculty of Mechanical Engineering of University of Tehran	2010
<b>Ranked 4<sup>th</sup> in B.Sc.</b> in Mechanical Engineering, University of Tehran	2013
<b>Exempted from the Entrance Exam and Tuition for Graduate Studies (M.Sc.)</b> , an Award That is Given to Top 10% Students in the Department	2013
Member of <b>Iranian National Elites Foundation (INEF)</b>	2013-Present
<b>Ranked 291<sup>th</sup> in the Nationwide Physics &amp; Mathematics</b> University Entrance Exam among 300,000 Participants in Iran*	2009
<b>Ranked 108<sup>th</sup> in the Nationwide Foreign Language English</b> University Entrance Exam among 280,000 Participants in Iran	2009
<b>Full scholarship</b> to the University of Tehran for Undergraduate and M. Sc. Programs	2009-2015
Member of <b>Elite Students of University of Tehran</b> , Tehran, Iran	2009-2015
Winning <b>Gold</b> medal in Regional High-school Students' "Science Olympiad" in Tehran	2004

\*In this exam I was ranked 1<sup>st</sup> in my high school.

## *Work and Research Experience*

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**PhD Assistant**, Laboratory for Hydraulic Machines, EPFL (May 2016-present)

- **Performing experimental study on tip vortex cavitation**

**Research Assistant, in the Project of “Reduction of Internal Consumptions in Steam-Gas Power Plants”** assigned by MAPNA Group to MAPFAN Institute (2012-2014).

- **Finding the optimum speed of pumps in the steam cycle according to real time data.**

**Research Assistant**, in the Hydraulic Machinery Research Institute (HMRI) at University of Tehran (2014-Present)

- **Writing the book “Applications of Small Hydraulic Machines in Renewable Energy”**

**Research Assistant**, in the Vehicle, Fuel, and Environment Research Institute (VFERI) at University of Tehran (2012-2013)

- **Working on Cardiovascular System and Blood Flow Dynamics**

**Designing Mechanical Energy Label** for Residential Buildings, Ministry of Roads & Urban Development, Iran (2014-2015)

- **Designing the Lable**
- **Proposing Improvement Algorithms**

**MapFan Institute** (2012-2016)

- **Gathering and translating the latest news in field of power generation and energy conversion**
- **Presenting the state-of-art in “Incinerators field”** (July 2015)
- **Participating as the Agent of University of Tehran in the workshop “CFD applications in boiler design and analysis” presented by Dr. P. Momeni form Doosan Company** (Sept. 2015)

**Active member in SAME** (Student Association of Mechanical Engineering) (2014-2016)

- **Managing and hosting the workshop “Biomechanics and Motor Control” presented by Prof. Perrier and Prof. Favier form University of Grenoble, France**
- **Selected as the Best “Student Association” in Irans’s National Competition of “Harekat”, among more than 700 other Student Associations in Iran** (October 2015)

## *Teaching Experience*

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<b>Turbomachinery</b> , Teaching Assistant, ME Department	Spring 2014, Fall 2014, Spring 2015
<b>Continuum Mechanics</b> , Teaching Assistant, ME Department, <b>Graduate</b>	Fall 2014
<b>Fluid Mechanics I</b> , Teaching Assistant, ME Department	Spring 2015
<b>Fluid Mechanics II</b> , Teaching Assistant, ME Department	Spring 2014
<b>Thermal Power Plants</b> , Teaching Assistant, ME Department	Fall 2014, Spring 2015, Fall 2015
<b>Heat Transfer</b> , Teacher Assistant, ME Department	Spring 2015
<b>Olympiad Team Adviser</b>	2013-present
<b>Hydraulic Machines Lab Internship</b>	Fall 2014

## *Computer skills*

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- **Engineering & Mathematics:** Gambit & Fluent / MATLAB / ADVISOR / Auto Cad / EES / COMSOL / Abaqus
- **Programming:** MATLAB / Familiar to C++
- **Applied Software:** Word / Excel / PowerPoint

## *Top Student*

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### **B. Sc.**

**Turbomachinery:** 19.6/20 (ranked 1<sup>st</sup>) / **Physics II:** 20/20 (ranked 1<sup>st</sup>)

**Optimization:** 20/20 (ranked 1<sup>st</sup>) / **Thermodynamics II:** 17.5/20 (ranked 3<sup>rd</sup>) / **Refrigeration:** 20/20 (ranked 1<sup>st</sup>)

**Mechanical Design I & II:** 18.6 & 19 / 20 (ranked 1<sup>st</sup>) / **Fluid Mechanics II:** 18.75/20 (ranked 3<sup>rd</sup>)

### **M. Sc.**

**Advanced Fluid Mechanics:** 20/20 (ranked 1<sup>st</sup>) / **Continuum Mechanics:** 20/20 (ranked 1<sup>st</sup>)

**Numerical Methods:** 20/20 (ranked 1<sup>st</sup>) / **Advanced Thermodynamics:** 20/20 (ranked 1<sup>st</sup>)

**Non-Newtonian Fluid Mechanics:** 19/20 (ranked 1<sup>st</sup>)

## *Languages*

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**Persian :** Native

**English :** Fluent

- **TOEFL iBT :** 107 (Reading:28 Listening:25 Speaking:29 Writing:25)
- **GRE General:** Verbal:150 / Quantitative:163/ Writing:3.5

**French :** Fluent

- **Niveau B2**

## *Selected Academic Projects*

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**Designing a centrifugal pump** and fining its blade profiles, Course: Turbomachinery, Prof. A. Nourbakhsh. Fall 2013

**Conceptual design of a TC-CO<sub>2</sub> power generation waste heat recovery system for Steam power plants**, course: Power Plant technology, Prof. M. Ashjaee Fall 2013

**Economic Analysis of a waste heat recovery option added to a combined cycle**, MBA Courses, Prof. Rabbani Summer 2015

<b>Real time optimization and control of window dimensions</b> , preparation as a paper, Prof. B Sajadi	Summer 2015
<b>Solving Cavity Problem</b> Using Finite Volume Method with Structured and Unstructured Mesh Course: Computational Fluid Dynamics, Prof. V. Esfahanian	Spring 2013
<b>Solving Blasius Boundary Layer Equation</b> Using Finite Difference Method with Keller-Box Scheme, Course: Computational Fluid Dynamics, Prof. V. Esfahanian	Spring 2013
Analysis of <b>Simple Gas Turbines with/without Heat Exchangers</b> , Using Matlab Coding Course: Gas Turbine, Prof. M. Raisee	Spring 2012
A Comprehensive <b>Analysis of State Equations</b> (Ideal gas, Van Der Waals and Redlich kwong), Using Matlab Coding. Course: Thermodynamics II, Prof. F. Kowsari	Fall 2011
Temperature and Heat Transfer Analysis of an <b>Engine Cooling Fin in Unsteady State Using Finite Element</b> Method Course: Heat Transfer I, Prof. M.Rahimian	Fall 2011
<b>Designing PID controller for a cantilevered bar</b> , course: Automatic Control, Prof. A. Yousefikoma	Fall 2011

## Hobbies

### Sports:

- Playing Soccer
- Swimming

### Reading:

- Scientific Books

## References

- **Mohamed Farhat**

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Professor of Mechanical Engineering  
École Polytechnique Fédérale de Lausanne, Switzerland  
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- **Ahmad Nourbakhsh**

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- **Behrang Sajadi**

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