

Ali Amini

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Date of Birth: December 14th, 1990

Gender: Male

City of Birth: Tehran, Iran

Marital Status: Married

Education

Ph.D. candidate in Mechanical Engineering / École Polytechnique Fédérale de Lausanne, Switzerland (2016-2020 expected)

- **Title of Ph.D. Thesis:** Physical Mechanisms and Flow Control of Tip Vortex Cavitation

One-year MBA Graduate Program, College of Engineering, 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 1st
- **Title of M.Sc. Project:** 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 4th
- **Title of B.Sc. Project:** 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 1st

Research Interests

Cavitation and Bubble Dynamics

Experimental and Numerical Fluid Flow

Turbulent Flow

Renewable Energy

Fluid-structure Interactions

Thermo-economic Optimization

Cardiovascular Flow

Publications

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 CO2 transcritical Rankine cycle." *Energy* 86 (2015): 74-84.
- **Ali Amini**, Amir Saman Eghtesad, and Kayvan Sadeghy. "Creeping flow of Herschel-Bulkley fluids in collapsible channels: A numerical study." *Korea-Australia Rheology Journal* 28.4 (2016): 255-265.

- Nima Mirkhani, **Ali Amini**, and Mehdi Ashjaee. "Thermo-economic analysis of transcritical CO2 cycles with bounded and unbounded reheats in low-temperature heat recovery applications." *Energy* 133 (2017): 676-690.
- Pedram Hanafizadeh, Javad Eshraghi, and **Ali Amini**. "Entropy analysis of buoyancy driven gas–liquid two-phase flow: Analytical and experimental approaches." *European Journal of Mechanics-B/Fluids* 59 (2016): 169-176.

Conference Papers

- **Ali Amini**, Martino Reclari, Takeshi Sano, Mohamed Farhat. "Effect of Gas Content on Tip Vortex Cavitation." 10th International Cavitation Symposium (cav2018), May 2018, Baltimore, USA.
- Mohammad Hossein Arabnejad, **Ali Amini**, Rickard Bensow, Mohamed Farhat. "Experimental and Numerical Investigation of the Cavitating Flows over a Modified NACA 0009 Foil" 10th International Cavitation Symposium (cav2018), May 2018, Baltimore, USA.
- Jeonghwa Seo, **Ali Amini**, Seung Jae Lee, Jongyeol Park, Honggu Yeo, Mohamed Farhat, and Shin Hyung Rhee. "An experimental study on suppressing Tip Vortex Cavitation by means of a Flexible Thread." In *APS Meeting Abstracts*. 2017.
- Javad Eshraghi, Erfan Kosari, Pedram Hadikhani, **Ali 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.

Books

- **Book Chapter: Ali Amini**, P. Asadi, P. Zolghadr, *Applications of Friction Stir Welding in Industry*. Chapter 15 of 'Advances in Friction Stir Welding and Processing' by Mohammad Kazem Besharati Givi, and Parviz Asadi, Woodhead publishing, Elsevier, 2014.

Honors and Awards

Ranked 2nd in the 18th Iran's National Olympiad in Mechanical Engineering	2013
Ranked 1st in M.Sc. in Mechanical Engineering, University of Tehran	2015
Ranked 4th in B.Sc. in Mechanical Engineering, University of Tehran	2013
Exempted from the Entrance Exam for Graduate Studies (M.Sc.) , an Award Given to the top 10% Students in the Department	2013
Member of Iranian National Elites Foundation (INEF)	2013-Present
Ranked 291th in the Nationwide Physics & Mathematics University Entrance Exam among 300,000 Participants in Iran	2009
Ranked 108th in the Nationwide Foreign Languages University Entrance Exam among 280,000 Participants in Iran	2009
Member of Elite Students of University of Tehran , Tehran, Iran	2009-2015
Winning Gold medal in Regional High-school Students' "Science Olympiad" in Tehran	2004

Work and Research Experience

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

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

Research Assistant, in MAPFAN Institute (2012-2014)

- **Project of “Reduction of Internal Consumptions in Steam-Gas Power Plants”** assigned by MAPNA Group
- Finding the optimum speed of pumps in the steam cycle according to real time data

Research Assistant, in Hydraulic Machinery Research Institute (HMRI) at University of Tehran (2014-2016)

- Participation in 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-the-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)

Member of 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

Turbomachinery , Teaching Assistant, ME Department	Spring 2014, Fall 2014, Spring 2015
Continuum Mechanics , Teaching Assistant, ME Department (Graduate)	Fall 2014
Fluid Mechanics I , Teaching Assistant, ME Department	Spring 2015
Fluid Mechanics II , Teaching Assistant, ME Department	Spring 2014
Thermal Power Plants , Teaching Assistant, ME Department	Fall 2014, Spring 2015, Fall 2015
Heat Transfer , Teacher Assistant, ME Department	Spring 2015
Olympiad Team Adviser	2013-2016
High School Physics & Math	2009-2016
English Teaching , Hoor Institute	Summer 2010

Computer skills

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

Top Student

B. Sc.

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

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

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

M. Sc.

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

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

Non-Newtonian Fluid Mechanics: 19/20 (ranked 1st)

Languages

Persian : Native

English : Fluent

- **TOEFL iBT :** 107 (Reading:28 Listening:25 Speaking:29 Writing:25)
- **GRE General:** Verbal:150 / Quantitative:169/ Writing:3.5

French : Fluent

- **Niveau C1**

German : Beginner

- **Niveau A1**

Selected Academic Projects

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

Conceptual design of a TC-CO₂ 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

Real time optimization and control of window dimensions, Prof. B Sajadi Summer 2015

Solving Cavity Problem Using Finite Volume Method with Structured and Unstructured Mesh Course: Computational Fluid Dynamics, Prof. V. Esfahanian Spring 2013

Solving Blasius Boundary Layer Equation Using Finite Difference Method with Keller-Box Scheme, Course: Computational Fluid Dynamics, Prof. V. Esfahanian Spring 2013

Analysis of Simple Gas Turbines with/without Heat Exchangers , Using Matlab Coding Course: Gas Turbine, Prof. M. Raisee	Spring 2012
A Comprehensive Analysis of State Equations (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 Engine Cooling Fin in Unsteady State Using Finite Element Method Course: Heat Transfer I, Prof. M. Rahimian	Fall 2011
Designing PID controller for a cantilevered bar , course: Automatic Control, Prof. A. Yousefikoma	Fall 2011

Hobbies

Sports:

- Playing Soccer
- Swimming

Reading:

- Scientific Books

References

- **Mohamed Farhat**

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École Polytechnique Fédérale de Lausanne, Switzerland
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