

# Azadeh Kebriaee

Department of Mechanical Engineering  
Sharif University of Technology, Tehran, Iran

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## Objective

Acquiring the Knowledge of Designing and Simulating any Dynamic Phenomenon, Predicting its Performance, and Enliven Them by Using My Observations.

## Education

**Sharif University of Technology** Tehran, Iran  
Bachelor of Science in Mechanical Engineering Sep. 1998 - 2003  
Thesis Title: "Flow Analysis in Pipes in Cleaning Process of Power Plants" Score: **20/20**  
Advisor: Prof. Mehrdad Taghizade Manzari  
GPA: 16.02/20

**Sharif University of Technology** Tehran, Iran  
Master of Science in Mechanical Engineering Sep. 2003 - 2006  
Thesis Title: "Numerical Simulation of Liquid Droplet Formation in Condensation Process" Score: **18.2/20**  
Advisor: Prof. Ali Nouri Boroujerdi  
GPA: 17.61/20

**Sharif University of Technology** Tehran, Iran  
PhD in Mechanical Engineering Sep. 2006 - 2011  
Thesis Title: "Flow Investigation inside Pressure-Swirl Atomizers"  
Advisor: Advisor: Prof. Ali Nouri Boroujerdi  
GPA: 18.19/20

**Farzanegan High School** Tehran, Iran  
*Part of National Organization for Development of Exceptional Talents (NODET)*  
Diploma on Physics and Mathematics Sep. 1995 - 1998  
GPA: 18.86/20 overall

## Honors and Awards

**Best Student Paper Award** NH, USA  
17<sup>th</sup> International Unmanned Untethered Submersible Technology Conference (UUST) Aug. 2011

**First Place Award** Isfahan, Iran  
*Mechanical Manager of Best Team in Detail Design among More than One Hundred University and Industrial Groups*  
Second Iranian National Autonomous Submersible Vehicle Competition (ASVC) Oct. 2010 - Aug. 2011

**First Place Award** Tehran, Iran  
*Mechanical Manager of Best Team in Detail Design among More than One Hundred University and Industrial Groups*  
Second Iranian National Autonomous Surface Vehicle Competition (ASVC) Aug. 2010 - May. 2011

**First Place Award** Isfahan, Iran  
*Mechanical Manager of Best Team in Detail Design among More than One Hundred University and Industrial Groups*  
First Iranian National RC Submarine Competition (RCSC) Aug. 2009 - April. 2010

**Special Design Award** Tehran, Iran  
*Mechanical Manager of Best Team in Artificial Intelligence Design among All Other Groups*  
First Iranian National RC Boat Competition (RCBC) Aug. 2007 - Oct. 2008

**Ranked 29<sup>th</sup>** Tehran, Iran  
*among More than 10,000 Participants*  
Iranian National Universities Entrance Exam for **M.S. Degree** Summer 2003

**Ranked 197<sup>th</sup>** Tehran, Iran  
*among More than 400,000 Participants*  
Iranian National Universities Entrance Exam for **B.Sc. Degree** Summer 1998

**Young Scholar Club** Tehran, Iran  
*Accepted the first Stage of 11<sup>th</sup> Iranian National Physics and Computer Olympiads* 1997

## Fields of Interest

- **Mechatronics**, Especially in Artificial Intelligence in Autonomous Robots
- **Autonomous Fluidic Vehicles**, Such as UUVs, UAVs and Amphibian Vehicles
- **Computational Fluid Dynamics**, Especially in the Two-Phase Flow and Atmospheric Flow
- **Instability Study**, Especially in Stabilizing Swirling Flows

## Courses

<b>Stanford University School of Engineering</b> ( <i>Registered to Participate</i> ) Introduction to Artificial Intelligence Advisors: Prof. Sebastian Thrun and Prof. Peter Norving	Online Course Oct. 2011 - Dec. 2011
<b>Stanford University School of Engineering</b> ( <i>Registered to Participate</i> ) Introduction to Machine Learning Advisors: Prof. Andrew Ng	Online Course Oct. 2011 - Dec. 2011
<b>MalekAshtar University of Technology</b> Workshops on Submarine Technology <ul style="list-style-type: none"> <li>• Introduction to Design and Production of Submarines</li> <li>• CATIA Software</li> <li>• Seals</li> <li>• Making and Manufacturing Workshop</li> </ul>	Isfahan, Iran Jun. 2009
<b>Sharif University of Technology</b> Workshops on Intelligent Boats <ul style="list-style-type: none"> <li>• Introduction on Intelligent Systems</li> <li>• Hydrodynamics Design of Surface Vehicle</li> <li>• Hydrostatics Design of Surface Vehicle</li> <li>• Introduction on Electrical Propulsion System</li> </ul>	Tehran, Iran Oct. 2010
<b>Sharif University of Technology</b> Department of Electrical Engineering (Volunteer Student) <ul style="list-style-type: none"> <li>• Introduction to Electromagnetic</li> <li>• Digital Control</li> <li>• Modern Control</li> <li>• Industrial Control</li> </ul>	Tehran, Iran Fall 2008 Spring 2010 Spring 2010 Spring 2010

## Academic Experiences

### Teacher

<b>Farzanegan junior School</b> <i>Part of National Organization for Development of Exceptional Talents (NODET)</i> <ul style="list-style-type: none"> <li>• <b>Physics</b></li> <li>• <b>Simulation of Physical Phenomena by Computers</b></li> </ul>	Tehran, Iran Sep. 2005 - May. 2006 Sep. 2006 - May. 2008
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### Teacher Assistant

<b>Sharif University of Technology</b> <ul style="list-style-type: none"> <li>• <b>Heat Transfer I</b> Instructor: Prof. Mehrdad Taghizadeh Manzari</li> <li>• <b>Fluid Mechanics I</b> Instructor: Dr. Mohammad Beheshad Shafii</li> <li>• <b>Heat Transfer Lab</b> Instructor: Prof. Mohammad Hasan Saidi</li> <li>• <b>Fluid Mechanics Lab</b> Instructor: Prof. Bijan Farhanieh</li> </ul>	Tehran, Iran Sep. 2006 - Jan. 2007 Jan. 2007 - Jun. 2007 Jan. 2008 - Jun. 2008 Sep. 2008 - Jan. 2009
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### Research Assistant

<ul style="list-style-type: none"> <li>• <b>Pressure Swirl Atomizers</b> Scholarship: 1200\$ in one Semester</li> <li>• <b>Pressure Swirl Atomizers</b> Scholarship: 1200\$ in one Semester</li> </ul>	Sep. 2006 - Jan. 2007 Jan. 2007 - Jun. 2007
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## Professional Experiences

### *Work and Industrial Experiences*

<b>MEGA Motor Company (Gearbox and Motor Manufacturer)</b> Training Engineer	Tehran, Iran Oct. 2000, June 2001
<b>IranKhodro Company (Car Manufacturer)</b> Internship, Design Engineer in EBM Project (Geometric Quality Control of Body-in-White)	Tehran, Iran Sep. 2001 - Nov. 2003
<b>RADHA, Engineering and Management Consultant Company</b> Part-Time Design Engineer	Tehran, Iran 2003 - 2005
<ul style="list-style-type: none"> <li>• Software Providing to Design Shell &amp; Tube Heat Exchanger in Petroleum Industry Scale</li> <li>• Software Providing to Design Industrial Furnaces</li> </ul>	
<b>IranKhodro Company (Car Manufacturer)</b> Internship, Student Member in Study on Pressure Drop of Hydraulic Press in Peykan Assembly	Tehran, Iran Summer 2004
<b>Research Institute of Petroleum Industry</b> Simulation Engineer, CFD Simulation of OCM synthesis in Pilot Reactor	Tehran, Iran 2006 - 2007
<b>Sharif Subway Environmental Design Team</b> Director of Fire Department	Sharif University of Technology, Tehran, Iran Sep. 2008 - May. 2009
<b>Institute for Research in Fundamental Sciences (IPM)</b> Simulation Engineer, CFD Simulation of Wind Flow over Gargash Mountain to Build the First National 3.5 m Telescope Observatory in Iran Advisor: Dr. Mir-Abbas Jalali (Associate Professor)	Tehran, Iran 2010 - Present
<b>ARSIN Research and Development Group</b> Head of Mechanical Subgroup	Sharif University of Technology, Tehran, Iran Aug. 2007 - Present
<ul style="list-style-type: none"> <li>• Simulation of Hydrodynamic Behavior of AUV hull by Computational Fluid Dynamics</li> <li>• Design of Propulsion System for Water Vehicles (Single Propeller, Ducted Propeller, Ducted Contra-Rotating Propellers)</li> <li>• Design of Maneuver System for Water Vehicles (Rudder System, Vectored Thrust System)</li> <li>• Simulation of Dynamic Behavior of Propulsion System and Maneuver System of AUVs and High Speed Boat</li> <li>• Hull Transom Design for High Speed Boat</li> </ul>	

### *Administrative Experiences*

<b>ARSIN Research and Development Group</b> Head of Mechanical Subgroup Advisor: Dr. Mahmoud Saadat Foumani (Assistant Professor)	Sharif University of Technology, Tehran, Iran Aug. 2007 - Oct. 2008
<b>ARSIN Research and Development Group</b> Head of Mechanical Subgroup Advisor: Prof. Gholamreza Vossoughi	Sharif University of Technology, Tehran, Iran Aug. 2009 - April. 2010
<b>ARSIN Research and Development Group</b> Head of Mechanical Subgroup Advisor: Prof. Gholamreza Vossoughi	Sharif University of Technology, Tehran, Iran Aug. 2010 - Present
<b>Numerical Study on Pressure-Swirl Atomizer Behavior</b> Co-Adviser in B.Sc. Thesis of Sina Aghaee Advisor: Prof. Ali Nouri-Boroujerdi	Sharif University of Technology, Tehran, Iran May 2008
<b>Study On Splashing of Droplets by High Speed Camera</b> Co-adviser in Bs. Thesis of Arezoo Rabiee and Saeedeh Gaeeni Advisor: Prof. Ali Nouri-Boroujerdi and Prof. Bahar Firoozabadi	Sharif University of Technology, Tehran, Iran May 2009
<b>Study On Thermal Instability Over Gargash Mountain</b> Co-adviser in Bs. Thesis of Farshad Nasiri and Mohammad Davari Advisor: Prof. Mir-Abbas Jalali	Sharif University of Technology, Tehran, Iran Sep. 2011

## Publications

### Journal Papers

- 1- Pedram Hanafizadeh, Mohammad Hasan Saidi, Masoud Darbandi, and **Azadeh Kebriaee**, "Numerical Simulation of Two-Phase Flow in Airlift Pumps Using the Physical Influence Scheme", *Progress in Computational Fluid Dynamics*, Vol. 10, No. 3, pp. 186-194, May 25, 2010. (DOI: 10.1504/PCFD.2010.033330)
- 2- Reza Maddahian, **Azadeh Kebriaee**, Bijan Farhanieh, and Bahar Firoozabadi, "Analytical investigation of boundary layer growth and swirl intensity decay rate in a pipe", *Archive of Applied Mechanics*, Volume 81, Number 4, pp. 489-501. (DOI: 10.1007/s00419-010-0424-9)
- 3- Saman Tashakor, Ghasem Jahanfarnia, **Azadeh Kebriaee**, "Numerical model for estimation of corrosion location in nuclear power plant steam generators", *Nuclear Engineering and Design*, Volume 241, Issue 1, January 2011, Pages 95-100. (DOI:10.1016/j.nucengdes.2010.10.020)
- 4- Ali Nouri-Boroujerdi, **Azadeh Kebriaee**, "Upwind Compact and Explicit High Order Finite Difference Schemes for Level Set Technique", *International Journal for Computational Methods in Engineering Science & Mechanics*. (Accepted June 2011)
- 5- Ali Nouri-Boroujerdi, **Azadeh Kebriaee**, "Simulation of Turbulent Swirling Flow in Convergent Nozzles", *Scientia Iranica Journal*. (Accepted August 2011)
- 6- Ali Nouri-Boroujerdi, **Azadeh Kebriaee**, "Numerical Simulation of Laminar and Turbulent Two-Phase Flow in Pressure-Swirl Atomizers", *AIAA Journal*. (Revised August 2011)
- 7- Ali Nouri-Boroujerdi, **Azadeh Kebriaee**, "Instability Investigation of Taylor-Couette Flow with an Axial Velocity by  $D^4$  Chebyshev Tau-Method", *Journal of Applied Numerical Mathematics*.

### Upcoming Journal Papers

- 1- **Azadeh Kebriaee**, Hamidreza Nasiri, "Applying Optimization Tools to Design Ducted Contra-Rotating Propellers Based on Lifting-Line Theory", *Applied Ocean Research*.
- 2- **Azadeh Kebriaee**, Hamidreza Nasiri, "The AUV Design Based on Component Modeling and Simulation", *International Journal of Ocean Systems Engineering*.
- 3- Mir Abbas Jalali, **Azadeh Kebriaee**, Atefeh Khoshnood, Maziar Heidari, and Habib G. Khosroshahi, "Airflow and Turbulence Modeling over Iranian National Observatory Site", *Mon. Not. R. Astron. Soc*.

### Conference Papers

- 1- Ali Nouri-Boroujerdi, **Azadeh. Kebriaee**, "Modeling of Droplet Formation in Condensation Process in Eulerian-Lagrangian System", *10<sup>th</sup> Fluid Dynamic Conference*, Yazd University, Yazd, Iran, October 2006.
- 2- Ali Nouri-Boroujerdi, **Azadeh. Kebriaee**, "Pressure Loss of Turbulent Swirling Flow in Convergent Nozzles", *18<sup>th</sup> Annual International Conference on Mechanical Engineering*, Sharif University, Tehran, Iran, May 2010.
- 3- Ali Nouri-Boroujerdi, **Azadeh. Kebriaee**, "Instability Investigation of Taylor-Couette Flow with an Axial Velocity", *19<sup>th</sup> Annual International Conference on Mechanical Engineering*, Birjand University, Birjand, Iran, May 2011.
- 4- **Azadeh Kebriaee**, Hamidreza Nasiri, "Mechanical Design Procedure and Computer Based Simulation of Autonomous Underwater Vehicle", *17<sup>th</sup> International Unmanned Untethered Submersible Technology Conference (UUST)*, Portsmouth, NH, USA, August 2011.
- 5- **Azadeh Kebriaee**, Hamidreza Nasiri, "Optimum Design and Simulation of Ducted Contra-Rotating Propellers with Lifting-Line Theory, Neural Network, and Genetic Algorithm", *17<sup>th</sup> International Unmanned Untethered Submersible Technology Conference (UUST)*, Portsmouth, NH, USA, August 2011. Awarded as **Best Student Paper**
- 6- **Azadeh Kebriaee**, Hamidreza Nasiri, "The AUV Design Based on Component Modeling and Simulation", *International Conference on Ocean Systems Engineering (ICOSE)*, Seoul, Korea, September 2011 (Accepted).
- 7- Hamidreza Nasiri, **Azadeh Kebriaee**, and Javad Sheikhi, "Design of AUV Vectored Thrust Propulsion System Based on Ducted Contra-Rotating Propellers", *13<sup>th</sup> Marine Industries Conference (MIC)*, Kish Island, Iran, November 2011 (Submitted).

### Posters

- 1- **Azadeh Kebriaee**, Hamidreza Nasiri, "Design and Offline Simulation of Autonomous Underwater Vehicle (AUV)", *Summer Simulation Multiconference (SummerSim)*, Hague, Netherlands, June 2011.

## Technical Reports

- 1- Hosein Khasteh, **Azadeh Kebriaee**, Hamidreza Nasiri, Mohammad Ali Hoseini Tash, Mahyar Fazlyab, Amir Ghazanfari, and Mahmoud Saadat Foumani, "Conceptual Design of a Remote Control High Speed Boat", *National RC Boat Competition (RCBC)*, Tehran, Iran, October 2007.
- 2- Hosein Khasteh, **Azadeh Kebriaee**, Hamidreza Nasiri, Mohammad Ali Hoseini Tash, Mahyar Fazlyab, Amir Ghazanfari, Syavash Ghorshi, Mohammad Akbari, and Mahmoud Saadat Foumani, "Detail Design of a Remote Control High Speed Boat", *National RC Boat Competition (RCBC)*, Tehran, Iran, May 2008.
- 3- Hamidreza Nasiri, **Azadeh Kebriaee**, Mohammad Akbari, Amir Ghazanfari, Syavash Ghorshi, Morteza Taherinejad, Alireza Karim Aghalu, and Gholamreza Vossoughi, "Conceptual Design of a Remote Control Intelligent Submarine", *National RC Submarine Competition (RCSC)*, Isfahan, Iran, September 2009.
- 4- Hamidreza Nasiri, **Azadeh Kebriaee**, Morteza Taherinejad, Amir Ghazanfari, and Gholamreza Vossoughi, "Detail Design of a Remote Control Intelligent Submarine", *National RC Submarine Competition (RCSC)*, Isfahan, Iran, April 2010. Awarded as **Best Detail Design Report**
- 5- Hamidreza Nasiri, **Azadeh Kebriaee**, Aliasghar Razavi Haeri, Majid Khalili, and Gholamreza Vossoughi, "Conceptual Design of an Autonomous Submersible Vehicle", *National Autonomous Submersible Vehicle Competition (ASVC)*, Isfahan, Iran, October 2010.
- 6- Hamidreza Nasiri, **Azadeh Kebriaee**, Hosein Sadeghikia, Aliasghar Razavi Haeri, Majid Khalili, and Gholamreza Vossoughi, "Detail Design of an Autonomous Surface Vehicle", *National Autonomous Surface Vehicle Competition (ASVC)*, Tehran, Iran, March 2011. Awarded as **Best Detail Design Report**
- 7- Hamidreza Nasiri, **Azadeh Kebriaee**, Javad Sheikhi, Aliasghar Razavi Haeri, and Gholamreza Vossoughi, "Detail Design of an Autonomous Submersible Vehicle", *National Autonomous Submersible Vehicle Competition (ASVC)*, Isfahan, Iran, September 2011. Awarded as **Best Detail Design Report**

## Selected Course Projects

- Incompressible and Compressible Boundary Layer Solution for NACA Airfoils with Applying Falkner-Scan and High-Order Compact Finite Difference Methods.
- Solution of Non-Linear Non-Viscous Berger's Equation by First and Second Order Upwind, Lax-Wendroff, Lax, MacCormak, Beam-Warming, Steger-Warming, Roe, and MUSCLE methods by Applying Different Limiters.
- Mesh Generation by Partial Differential Equations (Elliptical Method) Around Different NACA Airfoils.
- Solution of Quasi One Dimensional Euler Equations by Beam-Warming, Steger-Warming, and TVD Method.
- Solution of Two Dimensional and Axisymmetric Euler Equations by Jameson Finite Volume Method.
- High accurate Solution of Navier-Stokes Equation on Flat Plate and Cavity by High-Order Compact Finite Difference Method and 4<sup>th</sup> Order Runge-Kutta Method.
- Solution of One and Two Dimensional Heat-Transfer and Convection-Diffusion Equations by First, Second, and Third Orders Finite Element Method.

## Technical Skills

### Programming Languages

- Microsoft Visual Fortran (*Expert*)
- Microsoft Visual C/C++ (*Limited*)
- Microsoft Visual Basic (*Limited*)

### Software

#### Mechanical Engineering

- Gambit
- Fluent
- Rhinoceros & RhinoMarine Plug-in
- AutoCAD
- SolidWorks
- Mechanical Desktop

#### Artificial Intelligence

- MATLAB Genetic Algorithm Toolbox
- MATLAB Neural Network Toolbox

#### Mathematics

- MATLAB
- MathWorks SIMULINK
- Maple

#### General

- Microsoft Windows
- Microsoft Office
- Linux (Familiar)

#### Graphics

- Autodesk 3ds Max
- Adobe Photoshop

## Languages familiarity

- Proficient Persian
- Fluent English
- Familiar with Arabic

## Extra Activities and Hobbies

### *Sports*

- Amateur in **Climbing Mountains**
- Expert in **Swimming**
- Familiar with **Ping Pong** and **Soccer**

### *Hobbies*

- Music and Movie
- Reading Novels
- Dreaming

## References

### **Dr. Ali Nouri-Boroujerdi (Professor)**

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Sharif University of Technology  
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### **Dr. Mir-Abbas Jalali (Associate Professor)**

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### **Dr. Gholamreza Vossoughi (Professor)**

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