Sanaz **Arabzadeh Esfarjani**

Senior Software Engineer · Physical Modeling

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Summary

Proven experienced software engineer with designing and developing production software used by leading engineering companies. A quick learner enthusiastic to learn new technologies and take on diverse challenges.

Skills

Programming Python, MATLAB, Simulink, Simscape, C, Javascript, Node.JS, SQL
Web Django with Python, Express with Node.JS, jQuery, HTML5
Tools MongoDB, Git, Agile

Courses & Projects

The Web Developer Bootcamp

Udemy Online Course *2019*

- Tools & technologies: Javascript, jQuery, HTML5, CSS3, Boostrap 4, Node.js, ExpressJS, MongoDB, REST, Authentications.
- A Patatap Clone project (Similar to Patatap.com, each key (A-Z) corresponds to a sound and a simple animation being played)- using jQuery, paper.js & howler.js.
- A Todo list app using jQuery.
- Color Game App - guessing the right color from RGB color code using DOM manipulation.
- Movie API project - A small project for working with APIs and handling JSON response.
- YelpCamp project (A review site for campgrounds) - Integration of frontend and backend to make a full-fledged application with CRUD functionalities using Database, REST APIS, and Authentication.

Machine Learning

Coursera Online Course *2017*

- Topics: Linear regression, logistic regression, regularization, neural networks, SVM, unsupervised learning, dimensionality reduction, anomaly detection, recommender systems.

Introduction to Data Science in Python

Coursera Online Course *2017*

- Libraries & Structures: Series, DataFrames, Pandas, Numpy, hypothesis tests.

Experience

The MathWorks, Inc. *Natick, Massachusetts*

Senior Software Engineer *Nov. 2013 - Present*

- Developed and implemented thermal fluid libraries in the Simscape physical modeling software. Work included the full product life-cycle from requirements through implementation, testing and documentation. The libraries have been used by leading engineering companies in their model-based design workflows.
- Presented the latest features and products in modeling battery thermal management system in electric vehicles at MAB (MathWorks Advisory Board). MAB is a large group of engineering and tech companies that work closely together with MathWorks.
- Worked with external business industry contacts to include new functionalities including the built-in fluids properties in Simscape Fluids libraries.

PerkinElmer Health Sciences Canada, Inc. *Woodbridge, Ontario, Canada*

Research Associate *Jun. 2012 - May. 2013*

- Developed a computational model of magneto-hydrodynamics (MHD) and particle transport in mass spectrometry technology to identify the main factors in design optimization. Worked directly with the chief technology scientist and the director of R&D.
- Work led to an innovative experimental initiative to develop the next-generation of spray injectors to increase the evaporation efficiency of aerosols in mass spectrometry instruments.
- Prepared technical reports and presented the results in American Association for Aerosol Research (AAAR) conference and European Winter Conference on Plasma Spectrochemistry (EWCPS).

Centre for Advancing Coating and Technology (CACT), University of Toronto *Toronto, Ontario, Canada*

Research Assistant> *Jan. 2006 - April. 2013*

- Created a computational platform for design and optimization of the process of carbon nanotube production by radio frequency inductively coupled plasma (RF-ICP) technology.
- Identified the limiting factors in the yield rate of carbon nanotubes in RF-ICP technology and developed a computational model to analyze the fluid flow and heat transfer in the system's initial re-design development.
- Conducted design validations of a chemical kinetic model for predicting the chemistry of generated nanoparticles and nanomaterial in the RF-ICP system through optimized parallel-computing implementations in an in-house CFD software.

MNA- Molecular and Nanomaterials Architecture Group, Steacie Institute for Molecular Sciences (SIMS), National Research Council of Canada, *Ottawa, Canada*

Visiting Worker *Jan. 2011 - Mar. 2011*

- Visited the experimental facilities of carbon nanotube production by RF-ICP technology to trans- late the essential aspects of the operating conditions in the experiments into the predicting computational model.
- Organized technical meetings with the research scientists and presented the progress report on the computational results in the internal meetings.

Multiphase Flow and Thermal Spray Laboratories, Concordia University *Montreal, Quebec, Canada*

Research Assistant *Sep. 2005 - Dec. 2007*

- Identified the effect of nanoparticle suspension solutions on liquid spray characteristics in thermal spray coating applications.
- Developed a computational model of the two-phase flow in an effervescent atomizer for nano-suspension spray technologies.

Education

University of Toronto *Toronto, Ontario, Canada*

Ph.D. in Mechanical Engineering *Apr. 2013*

- Dissertation topic: A Numerical Platform for the Synthesis of Carbon Nanotubes by RF Plasma Technology, GPA: 4/4

Concordia University *Montreal, Quebec, Canada*

M.Sc. in Mechanical Engineering *Dec. 2007*

- Thesis topic: Numerical Simulation of Two-phase Flow in an Effervescent Atomizer for Nano- suspension Spray, GPA: 4.15/4.3

Sharif University of Technology *Tehran, Iran*

B.Sc. in Mechanical Engineering *Jul. 2004*

- Thesis topic: Analytical Models of Energy Consumption in Residential Buildings in Iran, GPA: 16.46/20

Honors & Awards

2009-2013	, Ontario Graduate Scholarship (OGS)	*Toronto, Canada*
2012	, The American Association for Aerosol Research (AAAR) Student Travel Grantl	*Toronto, Canada*
2008-2011	, University of Toronto Open Fellowship	*Toronto, Canada*
2011	, School of Graduate Studies (SGS) Conference Grant, University of Toronto	*Toronto, Canada*
2011	, The MIE Graduate Student Travel Grant, University of Toronto	*Toronto, Canada*
2005-2007	, Concordia University International Tuition Fee Remission Award	*Montreal, Canada*
2007	, Nominee for best M.Sc. thesis at Concordia University, Montreal	*Montreal, Canada*

Invited Talks

Canadian Society of Iranian Engineers and Architects (Mohandes) *Toronto, Canada*

Invited Speaker *Nov. 2011*

- Presented new advances in modeling Single-Walled Carbon Nanotubes.

9th GMSICOSM-UT2 Graduate students workshop *Tokyo, Japan*

Presenter for CACT labs *Jun. 2010*

- Presented the recent work on numerical modeling of metal nanoparticles and single-walled carbon nanotubes in induction thermal plasma spray.

Publications

Book Chapters

- S. Arabzadeh Esfarjani, Numerical Simulation of Two-phase Flow in an Effervescent Atomizer, VDM Verlag Dr. Mller Publication.
- S. Arabzadeh Esfarjani, Heating and Cooling load calculations Chapters, Applied Energy Saving Handbook, T. Fatanat Didar (ed), Sharif University publications, Tehran (2006). (The first practical handbook on energy saving in Iran).

Peer-Reviewed Publications

- S. Arabzadeh Esfarjani, S. B. Dworkin, J. Mostaghimi, K. S. Kim, C. T. Kingston, B. Simard, and G. Soucy, "Detailed Numerical Simulation of Single-Walled Carbon Nanotube Synthesis in a Radio-Frequency Induction Thermal Plasma System", Journal of Physics Conference Series, 406 (2012) 012011.
- S. Arabzadeh Esfarjani, J. Mostaghimi, K. Kim, A. Shahverdi, and G. Soucy, "Radio Frequency Thermal Plasma: The Cutting Edge Technology in Production of Single-Walled Carbon Nanotubes", Journal of Thermal Science and Technology, 6 (2011) 307-322.
- S. Arabzadeh Esfarjani, and A. Dolatabadi, "A 3D Simulation of Two-phase Flow in an Effervescent Atomizer for Suspension Plasma spray", Surface and Coatings Technology, 203 (2008) 2074-2080.
- S. Arabzadeh Esfarjani, and A. Dolatabadi, "Numerical Simulation of Nano-Particle Suspension in an Effervescent Atomizer", Journal of Computational and Theoretical Nanoscience, 5(2008) 1-8.

Conference Proceedings and Presentations

- ”A Piezoelectrically Actuated Nebulizer for Inductively Coupled Plasma Mass Spectrometry (ICP-MS)”, S. Arabzadeh Esfarjani, H. R. Badiei, K. Kahen, and J. Mostaghimi, 31st American Association for Aerosol Research (AAAR) Annual Conference, Minnesota, USA, 8-12 October 2012.
- ”Detailed Numerical Simulation of Single-Walled Carbon Nanotube Synthesis in a Radio-Frequency Induction Thermal Plasma System”, S. Arabzadeh Esfarjani, S. B. Dworkin, J. Mostaghimi, K. S. Kim, C. T. Kingston, B. Simard, and G. Soucy, 12th High-Tech Plasma Processes Conference (HTPP-12), Bologna, Italy, 24-29 June 2012.
- ”Parametric Study of Thermo-Flow Fields in an Inductively Coupled RF Plasma Processing System for the Production of Single-Walled Carbon Nanotubes”, S. Arabzadeh Esfarjani, J. Mostaghimi, A. Shahverdi, G. Soucy, K. S. Kim, and B. Simard, 20th International Symposium on Plasma Chemistry (ISPC20), Philadelphia, USA, 24-29 July 2011.
- ”CFD Simulation of Single-walled Carbon Nanotube Growth in an RF Induction Thermal Plasma Process with Chemistry Model”, S. Arabzadeh Esfarjani, S. B. Dworkin, J. Mostaghimi, K. S. Kim, B. Simard, and G. Soucy, 42nd AIAA Plasma dynamics and Lasers Conference in conjunction with the 18th International Conference on MHD Energy Conversion (ICMHD), Honolulu, Hawaii, USA, 27 - 30 Jun 2011.
- ”Simulation of Single-walled CNT Growth in an RF Induction Thermal Plasma Process with a Detailed Chemistry-Particulate Model”, S. Arabzadeh Esfarjani, S. B. Dworkin, and J. Mostaghimi, SIMS-NRC strategic meeting, Ottawa, Ontario, Canada, 6 December 2010.
- ”In situ Purity Enhancement and Surface Modification of Single-Walled carbon Nanotubes Synthesized by Induction Thermal Plasma”, A. Shahverdi, K. Kim, Y. Alinejad, S. Arabzadeh Esfarjani, J. Mostaghimi, and G. Soucy, NT10 Eleventh International Conference on the Science and Application of Nanotubes, Montreal, Quebec, Canada, June 27-July 2, 2010.
- ”Reactive Flows and Vortices”, S. Arabzadeh Esfarjani, A. Bourlioux, A. D. Foucault, P. Gauthier, A. Majumdar, C. Mavriplis, M. M. Ramirez, S. Peppin, M. Pugh, L.X. Proulx, T. Reis, N. Shahbazian, Third Montreal Industrial Problem Solving Workshop, MITACS, Centre de Recherches Mathematiques, Universite de Montreal, August 17 - 21 2009.
- ”A 3D Simulation of Two-phase Flow in an Effervescent Atomizer for Suspension Plasma spray”, S. Arabzadeh Esfarjani, and A. Dolatabadi, Proceedings of 2nd International Workshop on Suspension and Solution Thermal Spraying (S2TS), Tours, France, June 5-7, 2008.