

February 2021

Ahmad Vasel-Be-Hagh
Curriculum Vitae

Mechanical Engineering Department
Tennessee Technological University
+1-931-372-6468 | avaselbehagh@tntech.edu

EDUCATION

Postdoc	Ocean Engineering	University of Delaware	USA	2015-2017
Ph.D.	Mechanical Engineering	University of Windsor	Canada	2011-2015
M.Sc.	Mechanical Engineering	Ferdowsi University	Iran	2008-2011
B.Sc.,	Mechanical Engineering	Ferdowsi University	Iran	2004-2008

PROFESSIONAL APPOINTMENTS

2017 – Assistant Professor Mechanical Engineering Tennessee Tech University USA

GRANTS

2020-2021	PI	Development of a Laser-Based System for Maintenance of Ice Condensers, Tennessee Valley Authority, \$185,000.00.
2019 – 2020	PI	Application of Artificial Intelligence for Air Pollution Monitoring and Remediation using Neural Network and Deep Learning, HKF Technology LLC, \$10,619.00
2019 -2020	PI	Advanced wake loss modeling for large wind farms with variable wind speed and direction, US Department of Interior (via University of Delaware), \$20,715.00
2016	PI	Investigating the impact of wind turbines on surface fluxes using computational fluid dynamics, First State Marine Wind LLC, \$45,076.00

EDITORIAL RECORDS

2019 - present	Book: “ <i>Utility-Scale Wind Turbines and Wind Farms</i> ,” The Institution of Engineering and Technology (IET), London, UK.
2019 - present	Journal Special Issue: “ <i>Tomorrow Energy & Resources</i> ,” Sustainable Energy Technologies and Assessments, Elsevier.
2020	Book: “ <i>Environmental Management of Air, Water, Agriculture, and Energy, Food</i> ,” CRC Press, Boca Raton, USA, ISBN: 9780429196607, DOI: 10.1201/9780429196607, pp. 234.
2020	Proceedings: “ <i>Complementary Resources for Tomorrow</i> ,” Springer International Publishing, ISBN: 978-3-030-38803-4, DOI:10.1007/978-3-030-38804-1, pp. VII, 250.
2018 - 2020	Journal Special Issue: “ <i>Future and Sustainability</i> ,” International Journal of Sustainable Energy, Taylor and Francis.
2019	Book: “ <i>Advances in Sustainable Energy</i> ,” Springer, ISBN: 978-3-030-05635-3, DOI: 10.1007/978-3-030-05636-0, pp. VI, 193.

- 2019 Proceedings: “*The Energy Mix for Sustaining Our Future: Selected Papers from Proceedings of Energy and Sustainability*,” Springer International Publishing, ISBN: 978-3-030-00104-9, DOI: 10.1007/978-3-030-00105-6, pp. VI, 181.
- 2018-19 Journal Special Issue: “*Further Integration and Advancement of Sustainability*,” Sustainable Energy Technologies and Assessments, Elsevier.
- 2017-18 Journal Special Issue: “*Natural Resources and Energy Usage*,” Sustainable Energy Technologies and Assessments, Elsevier.
- 2017 Proceedings of the International Conference of Numerical Analysis and Applied Mathematics (ICNAAM 2017), American Institute of Physics (AIP).

PUBLICATIONS

Chapters

- In press Unser, L., **Vasel-Be-Hagh, A.**, Chapter 3: “Scaling Utility-Scale Wind Turbines,” In: “Utility-Scale Wind Turbines and Wind Farms,” The Institution of Engineering and Technology (IET), pp. 8.
- In press Hackler, M., **Vasel-Be-Hagh, A.**, Chapter 1: “The Current Status of Wind Power,” In: “Utility-Scale Wind Turbines and Wind Farms,” The Institution of Engineering and Technology (IET), pp. 13.
- 2020 Unser, L., **Vasel-Be-Hagh, A.**, Chapter 10: “A Preliminary Evaluation on the Performance of Diffuser-augmented Vertical Axis Wind Turbines,” In: “Complementary Resources for Tomorrow,” Springer Nature, 163-174, DOI: 10.1007/978-3-030-38804-1_10.
- 2020 Long, C.S., **Vasel-Be-Hagh, A.**, Chapter 6: “*Storage-Integrated Energy Harvesters*,” In: “Environmental Management of Air, Water, Agriculture, and Energy,” Routledge, 119-140, DOI: [10.1201/9780429196607](https://doi.org/10.1201/9780429196607).
- 2018 **Vasel-Be-Hagh, A.**, Chapter 3: “Optimization of Wind Farms for Communities,” In: “Wind and Solar Based Energy Systems for Communities,” The Institution of Engineering and Technology (IET), 28-61, DOI: 10.1049/PBPO130E_ch3.

Peer Reviewed Journal Articles

- In Review Ma, Y., Archer, C.L., **Vasel-Be-Hagh, A.**, “The Jensen wind farm parameterization for the WRF and MPAS models,” *Monthly Weather Reviews*.
- In Review Nash, R., Nouri, R., **Vasel-Be-Hagh, A.**, “Wind Turbine Wake Control Strategies: A Review and Concept Proposal,” *Energy Conversion and Management*.
- 2020 Nouri, R., **Vasel-Be-Hagh, A.**, Archer, C., “The Coriolis Force and the Direction of Rotation of the Blades Significantly Affect the Wake of Wind Turbines,” *Applied Energy*, 277, 115511.
- 2020 Archer, C.L., **Vasel-Be-Hagh, A.**, Corrigendum to “Review and Evaluation of Wake Loss Models for Wind Energy Applications,” [*Applied Energy* 226 (2018) 1187–1207]
- 2019 Archer, C.L., **Vasel-Be-Hagh, A.**, “Wake Steering via Yaw Control in Multi-Turbine Wind Farms: Recommendations based on Large-Eddy Simulation,” *Sustainable Energy Technologies and Assessments*, 33, 34-43.
- 2019 Archer, C.L., Wu, S., **Vasel-Be-Hagh, A.**, Brodie, J.F., Delgado, R., St. Pe, A., Oncley, S., Semmer, S., “Meteorological Observations of Wind Turbine Effects in the Atmospheric Boundary Layer: The VERTEX Field Campaign,” *Journal of Turbulence*.
- 2019 Zhang, W., Maleki, A., Gholipour Khajeh, M., Zhang, Y., Mortazavi, S.M., **Vasel-Be-Hagh, A.**, “A Novel Framework for Integrated Energy Optimization of a Cement Plant:

- An Industrial Case Study,” *Sustainable Energy Technologies and Assessments*, 35, 245-256.
- 2019 Dittner, M.E., **Vasel-Be-Hagh, A.**, “Advances in Wind Power Forecasting,” *Lecture Notes in Energy*, 70, 37-57.
- 2018 Archer, C.L., **Vasel-Be-Hagh, A.**, Wu, S., Pan, Y., Yan, C., Brodie, J.F., Maguire, E., “Review and Evaluation of Wake Loss Models for Wind Energy Applications,” *Applied Energy*, 226, 1187-1207.
- 2017 **Vasel-Be-Hagh, A.**, Iakovidis, F., “The Effect of Wind Direction on the Performance of Solar PV Plants,” *Energy Conversion and Management*, 153, 455-461.
- 2017 **Vasel-Be-Hagh, A.**, Archer, C., “Wind Farm Hub Height Optimization,” *Applied Energy*, 195C: 905-921.
- 2017 **Vasel-Be-Hagh, A.**, Archer, C., “Wind Farms with Counter-Rotating Wind Turbines,” *Sustainable Energy Technologies and Assessments*, 24, 19-30.
- 2015 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., Turner, J.S., “Drag of Buoyant Vortex Rings,” *Physical Review E*, 92/4: 1-5.
- 2015 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “A Balloon Bursting Underwater,” *Journal of Fluid Mechanics*, 769: 522 – 540.
- 2015 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Flow over Submerged Energy Storage Balloons in Closely and Widely Spaced Floral Configurations,” *Ocean Engineering*, 95: 59 – 77.
- 2015 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Structural Analysis of an Underwater Energy Storage Accumulator,” *Sustainable Energy Technologies and Assessments*, 11: 165 - 172.
- 2014 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Flow past an Accumulator Unit of an Underwater Energy Storage System: Three Touching Balloons in Floral Configuration,” *Journal of Marine Science and Application*, 13/4: 467 – 476.
- 2014 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Underwater Compressed Air Energy Storage Improved through Vortex Hydro Energy,” *Sustainable Energy Technologies and Assessments*, 7: 1 – 5.
- 2013 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Numerical Simulation of Flow past an Underwater Energy Storage Balloon,” *Computers and Fluids*, 88: 272 – 286.
- 2013 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Energy Storage using Weights Hydraulically Lifted above Ground,” *International Journal of Environmental Studies*, 70/5: 792 – 799.
- 2013 **Vasel-Be-Hagh, A.**, Ting, D.S.-K., Carriveau, R., “Correlating Flow Pattern with Force Coefficients in Air Flow past a Tandem Unit of Three Circular Cylinders,” *International Journal of Fluid Mechanics Research*, 40/3: 235 – 253.
- 2013 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “A Numerical Study on Shear Layer Behavior in Flow over a Square Unit of Four Cylinders at Reynolds Number of 200 using the LB Method,” *Progress in Computational Fluid Dynamics*, 13/4: 103 – 119.
- 2012 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “LB Simulation of Heat Transfer in Flow past a Square Unit of Four Isothermal Cylinders,” *Comptes Rendus Mecanique*, 340/7: 526 – 535.

Peer Reviewed Conference Proceedings

- 2016 **Vasel-Be-Hagh, A.**, Archer, C., “Hub Height Optimization to Increase Energy Production of Wind Farms,” *American Geophysical Union Fall Meeting*, San Francisco, USA, December 12 – 16.
- 2014 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Flow Induced Vibrations of an Underwater Energy Storage Accumulator,” *Offshore Energy and Storage Symposium*, Windsor, Canada, July 10 – 11.

- 2013 **Vasel-Be-Hagh, A.**, Carriveau, R., Ting, D.S.-K., “Flow past an Isolated Underwater Balloon,” *Canadian Congress of Applied Mechanics*, Saskatoon, Canada, June 2 – 6, 2013.
- 2011 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “Employment of Lattice Boltzmann Method in Simulating Flow past Two Equal Diameter Cylinders,” *Saudi Engineering Conference*, Buraydah, Saudi Arabia, December 10 – 13.
- 2011 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “An LB Study of Flow past Moderately and Widely Spaced Units of Four Cylinders: Flow Structure Simulation,” *Iranian Aerospace Society International Conference*, Tehran, Iran, March 1 – 3.
- 2010 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “A Lattice Boltzmann Simulation of Cross-Flow around Four Cylinders in a Square Arrangement,” *ASME Conference on Engineering Systems Design and Analysis*, Istanbul, Turkey, July 12 – 14.
- 2009 Esfahani, J.A., **Vasel-Be-Hagh, A.**, “Studying the Lattice Boltzmann Method by Simulating Couette Flow,” *Iranian Aerospace Society International Conference*, Isfahan, Iran, February 17 – 19.

TEACHING

Regular Courses

Atmospheric Fluid Mechanics

Spring 2021

Thermodynamics

Spring 2021; Spring 2020; Fall 2019

Intermediate Fluid Mechanics

Fall 2020

Fluid Mechanics

Fall 2020; Spring 2020; Spring 2019; Fall 2018 (two sections); Spring 2018; Fall 2017

Conductions Heat Transfer

Fall 2019

Directed-Study Courses

Phase Change Flows

Spring 2021

Aerodynamics of Damaged Wings

Spring 2020

Integrated Storage Technologies

Fall 2019

AWARDS, HONORS

- 2013-16 Outstanding Reviewer, Sustainable Energy Technology and Assessments, Elsevier
- 2016 T&E Theorist Award, Turbulence and Energy Laboratory, University of Windsor
- 2011 – 2015 Ontario Trillium Scholarship, Government of Ontario, Canada, \$160,000
- 2015 Mitacs-Accelerate Internship Award, Mitacs, Canada, \$21,000
- 2015 Innovative Researcher Award, Turbulence and Energy Laboratory, University of Windsor
- 2015 Author of the Year Award, Turbulence and Energy Laboratory, University of Windsor

2014	Creative Researcher Award, Turbulence and Energy Laboratory, University of Windsor
2014	Prolific Scientific Writer Award, Turbulence and Energy Laboratory, University of Windsor
2013	Graduate Student Award, 24 th Canadian Congress of Applied Mechanics, Saskatoon, Canada
2013	Author of the Year Award, Turbulence and Energy Laboratory, University of Windsor
2011	Doctoral Entrance Scholarship, University of Windsor, Canada, \$24,000
2009	Scientific Foundation Award, Outstanding Researcher, Mechanical Engineering Department, Ferdowsi University

SERVICE

Reviewer

NSF Panelist	Fluid Dynamics Program, 2021 Major Research Instrumentation Program, 2020
NSF Fastlane Reviewer	Environmental Sustainability Program 2021
Journal Reviewer:	<ul style="list-style-type: none"> - Atmosphere - Applied Energy - Sustainable Energy Technologies and Assessments - Energy Conversion and Management - Fluid Dynamics Research - Energies - International Journal of Numerical Methods for Heat & Fluid Flow - AIMS Energy - International Journal of Engineering and Technology Innovation

Chairman/Organizer

2021	Program Chair	Mitigating Climate Change, Windsor, Canada
2019	Program Chair	Energy & Resources for Tomorrow, Windsor, Canada
2018	Program Chair	Energy and Sustainability Conference, Windsor, Canada
2017	Symposium Organizer	Numerical Methods for Renewable Energy Applications Symposium, International Conference of Numerical Analysis and Applied Mathematics, Thessaloniki, Greece
2015	Session Chair	Natural Gas and Hydrogen Storage Symposium, Windsor, Canada
2015	Communication Chair	Web Development Natural Gas and Hydrogen Storage Symposium, Windsor, Canada
2014	Logistics	Offshore Energy and Storage Symposium, Windsor, Canada
2014	Logistics	Canadian Science Writers Association Annual Conference, Windsor, Canada

Committees

2019 – present	Graduate Committee	Mechanical Engineering Department, Tennessee Tech University
2018	Undergraduate Curriculum Committee	Mechanical Engineering Department, Tennessee Tech University

2018	Search Committee (Lecturer Position)	Mechanical Engineering Department, Tennessee Tech University
2018	Outstanding Poster Committee	Annual Research and Creative Inquiry Day, Tennessee Tech University
2016	Outstanding Student Paper Award Committee	American Geophysical Union Fall Meeting, San Francisco, CA, USA

Talks

- 2017 “Underwater Compressed Air Energy Storage”, ASME Student Chapter, Cookeville, TN
 2017 “Wind Farm Layout Optimization”, University of Windsor, Windsor, ON, Canada

STUDENTS ADVISED/EVALUATED

Adviser

PhD Students

1. Doug Clark (Summer 2018 –)
2. Reza Nouri (Spring 2019 –)
3. Daniel T Cannon (Fall 2020 –)

MSc Students

1. Madison E Dittner (Summer 2018 –Spring 2020)
2. Ryan R Nash (Fall 2018 – Spring 2020)
3. Cody Long (Fall 2018 – Summer 2020)
4. Michael Hackler (Fall 2020 –)
5. Hollee Sadler (Fall 2020 –)
6. Yang Zhao (Spring 2020 –)

Undergraduate Research Assistant:

7. Trenton Preston (Summer 2018): Recipient of the CISE grant
8. Jonathan Stephenson (Summer 2018): Funded via CESR
9. Benjamin Cooper (Spring 2019): Volunteer Researcher
10. Joshua Nichols (Summer 2019 – Summer 2020): Funded via Sponsored Project
11. Logan Unser (Summer 2019 – Fall 2020): Recipient of the CISE grant (twice)
12. Andrew Davis (Summer 2019 – Fall 2020): Partially Funded via CESR
13. Adam Becklehimer (Spring 2020): Funded via Sponsored Project
14. Stephen Foltz (Spring 2020 and Summer 2020): Recipient of the CISE grant
15. Henry Pace (Summer 2020 and Fall 2020): Volunteer Researcher
16. Ty Hagan (Summer 2020 –): Funded via Sponsored Project
17. Wesley Upshur (Fall 2020 and Spring 2021): Capstone
18. Caleb Dunlap (Fall 2020 and Spring 2021): Capstone
19. Christophe Blair (Fall 2020 and Spring 2021): Capstone
20. William McCarty (Spring 2020 –): Funded via Sponsored Project

Advisory Committee Member

21. Boma Kresning, PhD Student, University of Rhode Island, Advisor: Dr. Reza Hashemi
22. Drew E. Winder, PhD Student, Tennessee Tech University, Advisor: Dr. Sally Pardue
23. Mahdi Mohammadizade, PhD, Tennessee Tech, Advisor: Dr. Ismail Fidan
24. Mushrif Choudhury, PhD Student, Tennessee Tech University, Advisor: Dr. Jie Cui
25. Chaitanya Kodali, PhD Student, Tennessee Tech University, Advisor: Dr. Steve Idem
26. Jason Cook, PhD Student, Tennessee Tech University, Advisor: Dr. Ping Chen
27. Tyler R Qualls, MSc Student, Tennessee Tech University, Advisor: Dr. Ping Chen
28. Scott Vanderlan, PhD, Tennessee Tech University, Advisor: Dr. Jie Cui
29. Saanyol Igbax, PhD, Tennessee Tech University, Advisor: Dr. Steve Idem