ROYDON ANDREW FRASER
Abbreviated Curriculum Vitae (February 2021)

Mechanical & Mechatronics Engineering Department
University of Waterloo, 200 University Avenue West
Waterloo, Ontario, CANADA, N2L 3G1
519-888-4764 (Work) rafraser@uwaterloo.ca

EDUCATION:

P.Eng.	Professional Engineering	Ontario	1991
Ph.D.	Mechanical and Aerospace Engineering	Princeton University	1989
M.A.	Mechanical and Aerospace Engineering	Princeton University	1985
B.Sc. (Eng)	Engineering Physics	Queen's University	1983

EMPLOYMENT:

Professor	July 2003 to present	Mechanical and Mechatronics Engineering University of Waterloo
Associate Professor	July 1994 to June 2003	University of Waterloo
Assistant Professor	Sept. 1989 to June 1994	University of Waterloo
Visiting Researcher	Oct. 1988 to Aug. 1989	Sandia National Laboratories Livermore, California

MAJOR UNIVERSITY POSITIONS:

Teaching Chair	Mechancial & Mechatronics Engineering	2013-present
Chair	Advisory Committee on Engineering Scholarships	1999-present
Member	FAUW Academic Freedom & Tenure Committee	2001-present
Advisor	UW Alternative Fuels Team	1996-present
Organizer	Explorations (bringing grades 6 to 8 students to campus)	1998-2017
U/G Assoc Chair	Mechanical & Mechatronics Engineering	2006-2009
Member, Chair	FAUW (Chair 2004-2007)	2002-2014

AWARDS, FELLOWSHIPS, HONOURS, RECOGNITION:

Employment Awards:

- University of Waterloo Outstanding Performance Award 2006, **, 2013, 2016
- Faculty of Engineering Distinguished Performance Award 2002, 2003, 2005

Teaching Awards:

- U.S. National Science Foundation Outstanding Faculty Advisor Award 2010, 2014
- Faculty of Engineering Distinguished Teaching Award 2004

Fellowships

- U.S. DOE Applied Automotive Engineering Fellowship 2013

Other Awards and Achievements:

- 2021 Round 3 Final 5 Finalist - Social Capital Climate Challenge. Round 1 - 160 chosen from 1000+ applicants; Round 2 - 40 chosen after interview. Kelly Zheng, Thomas Sorwick, Roydon Fraser, and Jesse Van Griensven propose a framework to "occupy Earth", focusing on climate change, sustainability and decarbonization, with the ultimate intention of reversing the environmental harms we have caused and ensuring the longevity of humanity and our planet. (Recipient of award to be announced Feb 2021)
- 2015 1st Electric Mobility Canada Student Competition (Co-supervised) Theme: "Innovation and infrastructure for electric vehicles in Canada."

- 2006 Best Oral Presentation Award, 2006 SAE International Congress: Stevens, M.B., C. Mendes, M.W. Fowler, and R.A. Fraser, "Fuel Cell Hybrid Control Strategy Development," SAE Paper No. 2006-01-0214, April 3-7.
- 1996 Best 1996 ASHRAE Symposium Paper: De Abreu, P., R.A. Fraser, H.F. Sullivan and J.L. Wright, "A Study of Insulated Glazing Unit Surface Temperature Profiles Using Two- Dimensional Computer Simulation".
- 1995 Ontario Natural Gas Association's 1994 Ontario Environmental University Sponsorship Program Award Paper: Fraser, R.A., "Energy versus Humanity: A Discussion Paper for the Natural Gas Community," Ontario Natural Gas Association (ONGA), Toronto, 1995.

UW Alternative Fuels Team (UWAFT) Awards and Recognition
(as supervisor 1997-2004; as lead co-supervisor 2004-present):

- Many awards including three 1st place finished, and EcoCAR Advanced Vehicle Technology Competitions 2019 and 2020 Women in STEM Award.
- 2008 UWAFT' s Challenge X vehicle was the first student-built road capable hydrogen fuel cell vehicle
- 2007 Discovery Channel episode highlighting UWAFT fuel cell hybrid

Clean Snowmobile Team Awards
(supervisor 2000-2004)

- Consistent top 3 finisher, 1st in 2001.

Professional Engineers Ontario and Engineers Canada Awards:

- PEO Order of Honour, Officer Level to be awarded May 2021
- Ontario Volunteer Service Award, 25 years to be awarded Feb. 24, 2021
- Fellow of Engineers Canada (FEC) 2009

MAJOR EXTERNAL SERVICE:

Member	PEO Academic Requirements Committee (ARC)	1998–present
Member	Engineers Canada, Canadian Engineering Qualifications Board	2014-present
Councillor	Professional Engineers Ontario (PEO) [elected]	2017-2019 ,2015-2017, 2013-2015, 2011-2013, 2009-2011, 2007-2009, 2003-2005,2001-2003, 1998-2000
Director	Ontario Engineering Competition Board	1996-2013
Co-Founder	Engineers Without Boarders (EWB) (**Director** 2000-2003; **Treasurer** 2001-2003)	2000

TEACHING

Teaching Philosophy

Know your **A**udience, grab their **A**ttention, make it **M**emorable,
provide something **M**eaningful, and most important, **A**ctivate the student (AAMMA).
All with a touch of experimentation.

Courses Taught (last 6 years)	
Mechanical Engineering Practice 1 (ME100)	Thermodynamics (SD381,MSTE250,MTE309)
Heat Transfer 1 (ME 353)	Energy Conversion (ME459)
4th Year Design Projects (ME, CIV, SYDE)	Hybrid and Electric Vehicles (ME599)
Calculus 3 (ME201)	Hybrid Vehicle Design (ME760)
Energy and the Environment (ME659)	Combustion (ME657)
Mobile Air Pollution (ME760)	Exergy and Thermal Imaging (ERS675)

Period	Referred Journals	Books	Patents
Last 10 Years	75 (published/accepted) (3 submitted)	1 (4th and 5th Eds.)	2 (awarded) 2 (under review)

PATENTS

[1]. APPLICATION: Sharma, Rabindranath, Viswanath Sharma, Bhopal Narain, Chandrakant Sharma, Mahendra Nauth Sharma, Shaham Hosseininejad, Raj Krishna Sharma, Roydon Fraser, and Edward Vrscay (Applied December 2020). Non-Fracking Thermal Energy Storage/Retrival System. United States Patent Office. Application No. 13104989075.

[2]. APPLICATION: Thé, Jesse L and Roydon Fraser (Applied March 19, 2020). Method and System for Processing Oil Source Material and Other Materials. United States Patent Office, Application No. US 2020/0087575.

[3] CANADIAN PATENT: Canadian Patent Fraser, Roydon Andrew, Jesse, Thé, and Mohammad Hossein Ordouei (Granted Nov 11, 2017). Ultra-Low Water Input Oil Sands Recovery Process. Canadian Patent Office, Patent No. 2889568.

[4] U.S. PATENT: Thé, Jesse, Roydon Andrew Fraser, and Mohammad Hossein Ordouei (Granted Aug 22, 2017). Ultra-Low Water Input Oil Sands Recovery Process. United States Patent Office, Patent No. US 9,738,840 B2.

PUBLICATIONS (past 10 years)

Submitted:

[1] Sarmast, Sepideh, Roydon A. Fraser, and Maurice B. Dusseault (submitted Jan 2021). Performance and cycle heat behaviour of a partially adiabatic cased-wellbore compressed air energy storage system. Journal of Energy Storage, 38 pages.

[2] Mevawalla, S. Panchal, M-K. Tran, M. Fowler, and R. Fraser (submitted 2020). One Dimensional Fast Computational Partial Differential model for Heat Transfer in Lithium-Ion Batteries. Elsevier: Heat and Mass Transfer, 20 pages.

[3] Akhoundzadehr, M.H., S. Panchal, E. Samadani, K. Raahemifar, M. Fowler, and R. Fraser (submitted 2019). Investigation and simulation of electric train utilizing hydrogen fuel cell and lithium-ion battery. Elsevier: Sustainable Energy and technology Assessment, SETA-D-20-00330, 15 pages.

Accepted or In Press:

[4] Tran, Manh-Kien, Mobaderin Akinsanya, Satyam Panchal, Roydon Fraser, and Michael Fowler (2021). Design of a Hybrid Electric Vehicle Powertrain for Performance Optimization Considering Various Powertrain Components and Configurations. Vehicles 2021, 3, 20-32. https://doi.org/10.3390/vehicles3010002.

[5] Alzaben, Heba, Roydon Fraser, and Clarence Swanton (2021). The Role of Engineering Thermodynamics in Explaining the Inverse Correlation between Surface Temperature and supplied Nitrogen Rate in Corn Plants: A Greenhouse Case Study. Agriculture 2021, 11(2), 101, 16 pages. https://doi.org/10.3390/agriculture11020101.

[6] Mevawalla, Anosh, Satyam Panchal, Manh-Kien Tran, Michael Fowler, and Roydon Fraser (Dec 2020). Mathematical Heat Transfer Modeling and Experimental Validation of Lithium-Ion Battery Considering: Tab and Surface Temperature, Separator, Electrolyte Resistance, Anode-Cathode Irreversible and Reversible Heat. Batteries, 6, 61. doi:10.3390/batteries6040061

[7] Alzaben, Heba, Roydon Fraser, and Clarence Swanton (Nov 2019). An Inverse Correlation between Corn Temperature and Nitrogen Stress: A Field Case Study. Agronomy Journal, 111(6), 3207-3219. doi:10.2134/agronj2019.04.0309.

[8] Hamberg, L. Jonas, Roydon A. Fraser, Derek T. Robinson, Andrew J. Trant, and Stephen D. Murphy (Jun 2020). Surface temperature as an indicator of plant species diversity and restoration in oak woodland. Ecological Indicators, Elsevier, Vol 113, 12 pages. doi:10.1016/j.ecolind.2020.106249.

[9] Panchal, Satyam, Krishna Gudlanarva, Manh-Kien Tran, Roydon Fraser, and Michael Fowler (Apr 2020). High Reynold's Number Turbulent Model for Micro-Channel Cold Plate Using Reverse Engineering Approach for Water-Cooled Battery in Electric Vehicles", Energies 2020, Vol 13, 1638, 25 pages. doi:10.3390/en13071638

[10] Tran, Manh-Kiwn, Anosh Mevawala, Satyam Panchal, Kaamran Raahemifar, Michael Fowler, and Roydon Fraser (2020). Effect of integrating the hysteresis component to the equivalent circuit model of Lithium-ion battery for dynamic and non-dynamic applications. Journal of Energy Storage 32, 101785. doi:10.1016/j.est.2020.101785

[11] Akhoundzadeh, Mehran Haji, Kaamran Raahemifar, Satyam Panchal, Ehsan Samadani, Ehsan Haghi, Roydon Fraser, and Michael Fowler (May 2019). A Conceptualized Hydrail Powertrain: A Case Study of the Union Pearson Express Route. World Electric Vehicle Journal, Vol 10, Issue 2, 32, 14 pages. doi:10.3390/wevj10020032

[12] Rouindej, Kamyar, Ehsan Samadani, and Roydon Fraser (online Oct 2019; 2020). A comprehensive data-driven study of electrical power grid and its implications for the design, performance, and operational requirements of adiabatic compressed air energy storage systems. Elsevier: Applied Energy, Vol 257, 113990. doi:10.1016/j.apenergy.2019.113990

[13] Dehghani-Sanij, A.R., E. Tharumalingam, M.B. Dusseault, and R. Fraser (Apr 2019). Study of Energy Storage Systems and Environmental Challenges of Batteries. Elsevier: Renewable & Sustainable Energy Reviews, 104, 192–208. (IF: 12.11, Citations: 143) doi:10.1016/j.rser.2019.01.023

[14] Kinney, Carson, Alireza Dehghani-Sanij, SeyedBijan Mahbaz, Maurice B. Dusseault, Jatin S. Nathwani, and Roydon A. Fraser (Oct 2019). Geothermal Energy for Sustainable Food Production in Canada's Remote Northern Communities. Energies, 12(4058), 25 pages. doi:10.3390/en12214058

[15] Kazemi, A.R., S.B. Mahbaz, A.R. Dehghani-Sanij, M.B. Dusseault, and R. Fraser (online Jul 2019; Oct 2019). Performance Evaluation of an Enhanced Geothermal System in the Western Canada Sedimentary Basin. Elseveir: Renewable & Sustainable Energy Reviews, 113, 109278, 15 pages. doi:10.1016/j.rser.2019.109278

[16] Panchal, S., M. Haji Akhoundzadeh, K. Raahemifar, M. Fowler, and R. Fraser (2019). Heat and mass transfer modeling and investigation of multiple LiFePO4/graphite batteries in a pack at low C-rates with water-cooling. Elsevier: International Journal of Heat and Mass Transfer, Vol 135, 368-377. doi:10.1016/j.ijheatmasstransfer.2019.01.076

[17] Catton, John W. A., Sean B. Walker, Paul McInnis, Michael Fowler, Roydon A. Fraser, Steven B. Young, and Ben Gaffney (Jan 2019). Design and Analysis of the Use of Re-Purposed Electric Vehicle Batteries for Stationary Energy Storage in Canada. Batteries 2019, 5, 14, 19 pages. doi:10.3390/batteries5010014

[18] Catton, John, Ramin Shaikhi, Michael Fowler, and Roydon Fraser (2018). Designing and Developing an Effective Safety Program for a Student Project Team. Safety 2018, 4(2), 21 pages. https://doi.org/10.3390/safety4020021, doi:10.3390/safety4020021.

[19] Panchal, S., I. Dincer, M. Agelin-Chaab, R. Fraser, R., and M. Fowler (2018). Design and Simulation of a Lithium-ion Battery at Large C-Rates and Varying Boundary Conditions through Heat Flux Distributions", International Journal of Measurement, Vol. 116, pp. 382-390.

[20] Panchal, S., M. Mathew, I. Dincer, M. Agelin-Chaab, R. Fraser, and M. Fowler (Submitted 2017). Thermal and Electrical Performance Assessments of Lithium-Ion Battery Modules for an Electric Vehicle under Actual Drive Cycles. Electric Power Systems Research, Vol. 163, Part A, pgs. 18-27. doi.org/10.1016/j.epsr.2018.05.020

[21] Panchal, S. , M. Mathew, R. Fraser, and M. Fowler. (2018). Electrochemical thermal modeling and experimental measurements of 18650 lithium-ion cell for EV. Applied Thermal Engineering, Vol. 135, pgs. 123-132.
[22] Mastali, M., E. Foreman, A. Modjtahedi, E. Samadani, A. Amirfazli, S. Farhad, R. Fraser, and M. Fowler. (2018). Electrochemical-Thermal Modeling of a Commercial Graphite/LiFePO4 Prismatic Cell, Int. J. of Thermal Sciences, Vol. 129, pgs. 218–230.
[23] Panchal, S., F. Rashid, M. Long, M. Mathew, R. Fraser, and M. Fowler (2018). Degradation Testing and Modeling of 200Ah LiFePO4 Battery. SAE Tech. Paper 2018-01-0441, 9 pgs.
[24] Panchal, S., J. McGrory, J. Kong, I. Dincer, I., M. Agelin-Chaab, R. Fraser, R., and M. Fowler (2017). Cycling degradation testing and analysis of a LiFePO4 battery at actual conditions. International Journal of Energy Research, Vol. 41, Issue 15, pp. 2565-2575.
[25] Panchal, S., R. Khasow, I. Dincer, M. Agelin-Chaab, R. Fraser, and M. Fowler (2017). Thermal design and simulation of mini-channel cold plate for water cooled large sized prismatic Lithium-ion battery, Applied Thermal Engineering, Vol. 122, pp. 80-90.
[26] Panchal, S., I. Dincer, M. Agelin-Chaab, R. Fraser, and M. Fowler (2017). Transient Electrochemical Heat Transfer Modeling and Experimental Validation of a Large Sized LiFePO4/Graphite Battery. International Journal of Heat and Mass Transfer, Vol. 109, pp. 1239-1251.
[27] Panchal, S., R. Khasow, I. Dincer, M. Agelin-Chaab, R. Fraser, and M. Fowler (2017). Numerical modeling of a prismatic battery subjected to water cooling. Numerical Heat Transfer, Part A: Applications, Vol. 71, Issue 6, pp. 626-637.
[28] Catton, John, Caixia Wang, Steven Sherman, Michael Fowler, and Roydon Fraser (2017). Extended Range Electric Vehicle Powertrain Simulation, and Comparison with Consideration of Fuel Cell and Metal-Air Battery. SAE Tech. Paper 2017-01-1258, doi: 10.4271/2017-01-1258, 11 pgs.
[29] Panchal, S., S. Mathewson, R. Fraser, R., Culham, and M. Fowler (2017). Measurement of Temperature Gradient (dT/dy) and Temperature Response (dT/dt) of a Prismatic Lithium-ion Pouch Cell with LiFePO4 Cathode Material. SAE Tech. Paper 2017-01-1207, doi: 10.4271/2017-01-1207, 9 pgs.
[30] Panchal, S., I. Dincer, M. Agelin-Chaab, R. Fraser, R., and M. Fowler (2017). Uneven temperature and voltage distributions due to rapid discharge rates and different boundary conditions for series-connected LiFePO4 batteries. International Communications in Heat and Mass Transfer, Vol 81, pp. 210-217.
[31] Panchal, S., Dincer, I., Agelin-Chaab, M., Fraser, R., & Fowler, M., "Experimental and theoretical investigations of heat generation rates for a water cooled LiFePO4 battery", International Journal of Heat and Mass Transfer, Vol 101 (2016) 1093-1102. doi:10.1016/j.ijheatmasstransfer.2016.05.126.
[32] Panchal, S., Dincer, I., Agelin-Chaab, M., Fraser, R., & Fowler, M., "Experimental and Simulated Temperature Variations in a LiFePO4-20Ah Battery during Discharge Process", Applied Energy, 180 (2016) 504-515. doi: 10.1016/j.apenergy.2016.08.008.
[33] Panchal, Panchal, S.*, Dincer, I., Agelin-Chaab, M., Fraser, R., & Fowler, M., "Experimental Investigation and Simulation of Temperature Rise in a 16Ah-LiMnNiCoO2 Battery during Rapid Discharge Rates", Heat and Mass Transfer (HAMT), Vol 52 (2016), Issue 9, 1-10, doi: 10.1007/s00231-016-1870-x.
[34] Lawrence, C.P. and ElShatshat, R. and Salama, M.M.A. and Fraser, R.A.(2016). An Efficient Auxiliary System Controller for Fuel Cell Electric Vehicle (FCEV). Energy. 116: 417-428.
[35] Ellsworth, Patrick and Fraser, Roydon and Fowler Michael and VanLanen, Daniel and Gaffney, Ben and Wang, Caixia and Shen, Trong and Wu, Wenhao and McInnis, Paul. (2016). Control Analysis for Efficiency Optimization of a High Performance Hybrid Electric Vehicle with Both Pre and Post Transmission Motors. SAE Technical Paper, doi 10.4271/2016-01-1253. : 14 pages.

[36] Mastali, Mehrdad and Farkhondeh, Mohammad and Farhad, Siamak and Fraser, Roydon A and Fowler, Michael. (2016). Electrochemical Modeling of Commercial LiFePO4 and Graphite Electrodes: Kinetic and Transport Properties and Their Temperature Dependance. Journal of The Electrochemical Society. 163(13): A2803-A2816.

[37] Panchal, S., I. Dincer, M. Agelin-Cha, R. Fraser, M. Fowler (2016). Experimental temperature distributions in a prismatic lithium-ion battery at different discharge rates and varying boundary conditions. International Communications in Heat and Mass Transfer, 71, pages 35-43. doi:10.1016/j.icheatmasstransfer.2015.12.004.

[38] Panchal, S., I. Dincer, M. Agelin-Chaab, R. Fraser, M. Fowler (2016). Experimental and theoretical investigation of temperature distributions in a prismatic lithium-ion battery. International Journal of Thermal Sciences, 99, 204-212. doi:10.1016/j.ijthermalsci.2015.08.016.

[39] Panchal, S., I. Dincer, M. Agelin-Cha, R. Fraser, M. Fowler (2016). Thermal modeling and validation of temperature distributions in a prismatic lithium-ion battery at different discharge rates and varying boundary conditions. Applied Thermal Engineering, Volume 96, 5 March 2016, Pages 190–199. doi:10.1016/j.applthermaleng.2015.11.019.

[40] Adibi-Asl, Hadi and Fraser, Roydon A and McPhee, John. (2015). Acausal powertrain modelling with cycle-by-cycle spark ignition engine model. International Journal of Powertrains. 4(4): 353-370.

[41] Majdabadi-Kohnehi M., E. Samadani, S. Farhad, M.W. Fowler, R. Fraser (2015). Three-dimensional Multi-Particle Electrochemical Model of LiFePO4 Cells based on a Resistor Network Methodology. Electrochimica Acta, 190: 574-587, doi:10.1016/j.electacta.2015.12.122.

[42] Samadani, E., M. Mastali, S. Farhad, R. Fraser, M. Fowler (2015). Li-ion battery performance and degradation in electric vehicles under different usage scenarios. International Journal of Energy Research, 40(3): 379-392. Article first published online: 7 AUG. doi: 10.1002/er.3378.

[43] Ahmadi, L., S.B. Young, M. Fowler, R.A. Fraser, M.A. Achachlouei (2015). A cascaded life cycle: Reuse of electric vehicle lithium-ion battery packs in energy storage systems. International Journal of Life Cycle Assessment, 1-14. doi:10.1007/s11367-015-0959-7.

[44] Walker, S.B., C. Heymans, D. van Lanen, S.B. Young, R. Fraser, M. Fowler (2015). Incentives for the Reuse of Electric Vehicle Batteries for Load-Shifting in Residences. International Journal of Process Systems Engineering, 3 (1-3), page 70-89.

[45] Panchal, S., S. Mathewson, R. Fraser, R. Culham, M. Fowler (2015). Thermal Management of Lithium-Ion Pouch Cell with Indirect Liquid Cooling using Dual Cold Plates Approach. SAE Int. J. Alt. Power. 4(2):2015, 15 pages, SAE Technical Paper 2015-01-1184, doi:10.4271/2015-01-1184.

[46] Panchal, S., S. Mathewson, R. Fraser, R. Culham, M. Fowler, M. (2015). Experimental Measurements of Thermal Characteristics of LiFePO4 Battery. SAE Technical Paper 2015-01-1189, 2015, doi:10.4271/2015-01-1189.

[47] Ellsworth, P., W. Scott, M. Fowler, R. Fraser, B. Gaffney, D. van Lanen, D. (2015). Internal Resistance Optimization Utilizing “Just in Time” Control." SAE Technical Paper 2015-01-1234, 2015, doi:10.4271/2015-01-1234.

[48] Majdabadi-Kohneh, M., E. Samadani, S. Farhad, R. Fraser, M. Fowler (2015). Three-Dimensional Electrochemical Analysis of a Graphite/LiFePO4 Li-Ion Cell to Improve Its Durability. SAE Technical Paper 2015-01-1182, 2015, doi:10.4271/2015-01-1182.

[49] Samadani E., S. Farhad, W. Scott, M. Mastali, L.E. Gimenez, M. Fowler, M., R.A. Fraser (2015). Empirical modeling of lithium-ion batteries based on electrochemical impedance spectroscopy tests. Electrochimica Acta, 160, 169-177. doi:10.1016/j.electacta.2015.02.021

[50] El Sayed, A. and R. A. Fraser (2015). Conditional Moment Closure Modelling of a Lifted H2/N2 Turbulent Jet Flame using the Presumed Mapping Function Approach. Journal of Combustion, Vol. 2015, doi:10.1155/2015/257145, 24 pgs.

[51] Mastali Majdabadi, M., S. Farhad, M. Farkhondeh, R. Fraser, M. Fowler (2015). Simplified Electrochemical Multi-particle Model for LiFePO4 Cathodes in Lithium-ion Batteries. Journal of Power Sources, Vol. 275, 1 Feb 2015, pp. 633-643. doi:10.1016/j.jpowsour.2014.11.066.

[52] Adibi-Asl, Hadi, Roydon Fraser, John McPhee (2015). Math-based Spark Ignition Engine Modeling Including Emission Prediction for Control Applications. International Journal of Vehicle System Modeling and Testing, Inderscience Publisher, Vol 10, No. 2, pp. 148-167, doi:10.1504/IJVSMT.2015.068977.

[53] van Lanen, Daniel, Jennifer Cocking, Sean B. Walker, Michael Fowler, Roydon. Fraser, Steven B. Young, Leila Ahmadi, Alan Thai, Jake Yeung, Arthur Yip (2015). Economic and environmental analysis of a green energy hub with energy storage under fixed and variable pricing structures. International Journal of Process Systems Engineering, 3(1-3), page 158-180.

[54] Ahmadi, L., M. Fowler, S.B. Young, R.A. Fraser, B. Gaffney, and S.G. Walker (2014). Energy efficiency of Li-ion battery packs re-used in stationary power applications. Sustainable Energy Technologies and Assessments, Vol. 8, pgs. 9-17.

[55] Samadani, Ehsan, Siamak Farhad, Satyam Panchal, Roydon Fraser, and Michael Fowler (2014). Modeling and Evaluation of Li-ion Battery Performance Based on the Electric Vehicle Field Tests. SAE Paper No. 2014-01-1848, doi:10.4271/2014-01-1848. 8 pgs.

[56] Samadani, Ehsan, Leo Gimenez, William Scott, Siamak Farhad, Michael Fowler, and Roydon Fraser (2014). Thermal Behavior of Two Commercial Li-Ion Batteries for Plug-in Hybrid Electric Vehicles. SAE Paper No. 2014-01-1840, 2014, doi:10.4271/2014-01-1840, 14 pgs.

[57] Samadani, Ehsan, Roydon Fraser, and Michael Fowler (2014). Evaluation of Air Conditioning Impact on the Electric Vehicle Range and Li-Ion Battery Life. SAE Paper No. 2014-01-1853, doi:10.4271/2014-01-1853, 8 pgs.

[58] El Sayed, A. and R. A. Fraser (2014). Consistent Conditional Moment Closure Modelling of a Lifted Turbulent Jet Flame using the presumed b-PDF approach. Journal of Combustion, Vol. 2014, Article ID 507459, 25 pgs.

[59] Adibi, Hadi Asl, Ramin Masoudi, Roydon Fraser, John McPhee (2014). Symbolic Sensitivity Analysis of Math-based Spark Ignition Engine with Two-zone Combustion Model. SAE Paper No. 2014-01-1072, doi:10.4271/2014-01-1072, 12 pgs.

[60] Ahmadi, Leila, Arthur Yip, Michael Fowler, Steven B. Young, and Roydon A. Fraser (2014). Environmental Feasibility of Reuse of Electric Vehicle Batteries. Sustainable Energy Technologies and Assessments Journal, Vol. 6, pgs. 64-74.

[61] Mastali, M., J. Vazquez-Arenas, R. Fraser, M. Fowler, S. Afshar, and M. Stevens (2013). Battery State of the Charge Estimation Using Kalman Filtering. J. Power Sources, V239, pp. 294-307.

[62] Asl, Hadi Adibi, MMohammadreza Saeedi, Roydon Andrew Fraser, Paul Goossens, and John McPhee (2013), "Mean Value Engine Model Including Spark Timing for Powertrain Control Application," SAE Paper No. 2013-01-0247, SAE World Congress, Detroit, MI, April 16-18, 11 pages.

[63] Ali, Usman and Roydon Fraser (2013), "Numerical Modeling of Rear Subframe Under Different Loading Conditions," SAE Paper No. 2013-01-0571, SAE World Congress, Detroit, MI, April 16-18, 7 pages.

[64] Samadani, Ehsan, Josh Lo, Michael Fowler, Roydon Andrew Fraser, and Leonardo Gimenez (2013), "Impact of Ambient Temperature on the A123 Li-Ion Battery Performance and Hybrid Electric Vehicle Range," SAE Paper No. 2013-01-1521, SAE World Congress, Detroit, MI, April 16-18, 9 pages.

[65] Samadani, Sayed Ehsan, Roydon A. Fraser, and Michael Fowler (2012), "A Review Study of Methods for Lithium-ion Battery Health Monitoring and Remaining Life Estimation in Hybrid Electric Vehicles," SAE Paper No. 2013-01-0125, SAE World Congress, Detroit, MI, April 16-18, 12 pages.
[66] Singh, Gurhari Preet, Mark Cremasco, Eric Evenchick, Josh Lo, Michael Karpinski-Leydier, Trevor Sabiston, Brandon Walton, Roydon A. Fraser, and Michael Fowler (2012), "The University of Waterloo Alternative Fuels Team's Approach to EcoCAR 2," SAE Paper No. 2012-01-1761, SAE 2012 International Powertrains, Fuels & Lubricants Meeting, Malmo, Sweden, Sept 18, 19 pages.
[67] Gaudreau, K., R. A. Fraser, and Stephen Murphy (2012). "The Characteristics of the Exergy Reference Environment and Its Implications for Sustainability-Based Decision-Making." Energies Vol. 5 No. 7: pp. 2197-2213.
[68] Gaudreau, K., R. A. Fraser, and Stephen Murphy (2012). "The Characteristics of the Exergy Reference Environment and Its Implications for Sustainability-Based Decision-Making." Energies Vol. 5 No. 7: pp. 2197-2213.
[69] Asl, Hadi Adibi, MMohammadreza Saeedi, Roydon Andrew Fraser, Paul Goossens, and John McPhee (in press December 2012), "Mean Value Engine Model Including Spark Timing for Powertrain Control Application," SAE Paper No. 2013-01-0247, SAE World Congress, Detroit, MI, April 16-18, 11 pages.
[70] Tasnim, Syeda Humaira, Shohel Mahmud, and Roydon Andrew Fraser (2012), "Compressible pulsating convection through regular and random porous media: the thermoacoustic case," Heat and Mass Transfer (HMT-10-0394), Vol. 48, No. 2, pp. 329-342.
[71] Koch, A.K., M.W. Fowler, and R.A. Fraser (2011), "Implementation of a fuel cell plug-in hybrid electric vehicle and factors affecting transportation policy," Int. J. of Energy Research, Vol. 35, Issue 15, pp. 1371-1388.
[72] Wilhelm, E., M. Fowler, R.A. Fraser, and M. Stevens (2011). In-the-loop validation of fuel cell vehicle control. Int. J. Powertrains, Vol. 1, No. 2, pp. 162-178 (ref. no. IJPT-16770).
[73] Tasnim, S.H. and R.A. Fraser (2013). Modeling and analysis of flow, thermal, and energy fields within stacks of thermoacoustic engines filled with porous media. Heat Transfer Engineering, Vol. 34, Issue 1, January, pp. 84-97 (ref. no. HTE-9910).
[74] Mahmud, S., S.H. Tasnim, R.A. Fraser, and I. Pop (2011). Hydrodynamic and thermal interaction of a periodically oscillating fluid with a porous medium lying over a thick solid plate, International Journal of Thermal Sciences, Vol. 50, pp. 1908-1919.
[75] Tasnim, S.H., S. Mahmud, R.A. Fraser, and I. Pop (2011). Brinkman Forchheimer modeling for porous media thermoacoustic system. International Journal of Heat and Mass Transfer, Vol. 54, pp. 3811-3821.
[76] Tasnim, S.H., S. Mahmud, and R.A. Fraser (2011). Second law analysis of porous thermoacoustic stack systems, Applied Thermal Engineering, Vol. 31, pp. 2301-2311.
[77] Tasnim, S.H., S. Mahmud, and R.A. Fraser (2011). Measurements of thermal field in the stack extremities of a standing wave thermoacoustic heat pump, Frontiers in Heat and Mass Transfer, Vol. 2(1), pp. 1 - 10.
[78] Tasnim, S.H., Mahmud, S., and Fraser, R.A.(2011), "Measurements of thermal field in the stack extremities of a standing wave thermoacoustic heat pump," Frontiers in Heat and Mass Transfer, Vol. 2, 10 pages.
[79] Tasnim, S.H. and R.A. Fraser (2010). Computation of the flow and thermal fields in a thermoacoustic refrigerator. International Communications and Heat and Mass Transfer, Vol. 37, pp. 748-755.
[80] Tasnim, S.H. and R.A. Fraser (2010), "Computation of the flow and thermal fields in a thermoacoustic refrigerator," International Communications and Heat and Mass Transfer, Vol. 37, 748-755.

[81] Tasnim, S.H., and Fraser, R.A. (2010), "Thermal field measurements of a thermoacoustically driven thermoacoustic refrigerator," ASME Journal of Thermal Science and Engineering Applications, Vol. 2, Issue 2, 021010, 10 pages, June.

BOOKS

[82] Andrews, G.C., et al. (2015). Introduction to Professional Engineering in Canada. 4th Ed., Pearson, Toronto, 364p.

[83] Andrews, Gordon C., J. Dwight Aplevich, Roydon A. Fraser, and Carolyn MacGregor (2018). Introduction to Professional Engineering in Canada, 5th Ed., Pearson Canada, Toronto. ISBN-10: 0134204484 o ISBN-13: 9780134204482