

Amos G. Winter, V
Ratan N. Tata Associate Professor
Department of Mechanical Engineering
Massachusetts Institute of Technology

77 Massachusetts Ave.
MIT Room 3-449C
Cambridge, MA 02139
Phone: +1-617-253-6761
Website: <http://gear.mit.edu/>; Email: awinter@mit.edu

RESEARCH INTERESTS

Design for emerging markets and developing countries; international development; reverse innovation and cross-cultural technology transfer; fluid, solid, granular mechanics; biomechanics; mechanical, precision machine design; medical device design; water purification and desalination; irrigation; agricultural equipment

EDUCATION

Massachusetts Institute of Technology	Cambridge, MA
Ph.D. in Mechanical Engineering	2011
S.M. in Mechanical Engineering	2005
Tufts University	Medford, MA
B.S. in Mechanical Engineering, <i>Magna Cum Laude</i>	2003

EXPERIENCE

MIT Department of Mechanical Engineering	Cambridge, MA
Ratan N. Tata Career Development Associate Professor	July 2017 - Present
Ratan N. Tata Career Development Assistant Professor	July 2012-June 2017
Director, Global Engineering and Research (GEAR) Lab	July 2012-Present
Global Research Innovation and Technology (GRIT)	Cambridge, MA
Co-Founder and Chief Scientific Advisor	Sept. 2011-Present
Battelle Memorial Institute	Cambridge, MA
Contractor – RoboClam Project and Various Bluefin Robotics Projects	Sept. 2011-June 2012
MIT – Singapore University of Technology and Design (SUTD) International Design Center	Cambridge/Singapore
Post-Doctoral Associate – Leveraged Freedom Chair Project, Supervisor: Prof. Daniel Frey	Sept. 2010-June 2012
Indian Institute of Technology Delhi	New Delhi, India
Visiting Researcher – Leveraged Freedom Chair Project, Supervisor: Prof. Sudipto Mukherjee	Sept. 2010-June 2011
MIT Mobility Lab (M-Lab)	Cambridge, MA
Founder and Director, Project lead – Leveraged Freedom Chair	Dec. 2007-June 2012
SELECTED CONSULTING	
Sime Darby	Oct. 2016-Present
Usha International Ltd.	Nov. 2013-2016
Okuma Fishing	Oct. 2013-Apr. 2014

SELECTED AWARDS

The 2016 - 2017 MIT Harold E. Edgerton Faculty Achievement Award	2017
The 2017 National Science Foundation Faculty Early Career Development (CAREER) Award	2017
The 2017 MIT School of Engineering Junior Bose Award for Excellence in Teaching	2017
Named one of the 2016 Boston Globe Game Changers	2016
McKinsey Award, for the best article in Harvard Business Review in the past year	2016
USAID Desal Prize, First Place	2015
Rockefeller Foundation \$100k Innovation Challenge Winner	2012
Mass Challenge Startup Comp., \$100k Diamond Prize Winner, to Global Research Innovation and Tech.	2012
Fast Company Magazine Innovation by Design Award, Concept Category, for Leveraged Freedom Chair	2012
Robert N. Noyce Career Development Chair	2012

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SELECTED AWARDS, *continued*

Wall Street Journal Big Innovations of 2011 (one of seven) for the Leveraged Freedom Chair	2011
R&D 100 Award for the Leveraged Freedom Chair, given by R&D Magazine for the 100 most technologically significant products of the year	2010
R&D 100 Editors' Choice Award for the Leveraged Freedom Chair, given to the three favorite R&D 100 award winners by the magazine's editors	2010

PATENTS

1. A.G. Winter, V. "Turbocharged Single Cylinder Internal Combustion Engine Using an Air Capacitor", US Patent No. 9222405 B2, issued Dec. 29, 2015.
2. Winter V, A.G., et al. "Wheelchair with Lever Drivetrain." U.S. Patent No. 8844959 B2, issued Sept. 30, 2014.
3. Winter V, A.G., A.E. Hosoi, A.H. Slocum. "Method and Apparatus for Penetrating Particulate Substrates." Patent no. 8496410 B2, issued Jul. 30, 2013.

SELECTED PUBLICATIONS - *Peer-Reviewed Journal Articles & Conference Papers*

1. Shah, S.R., Wright, N.C., Nepsky, P., Winter V, A.G. **"Optimal Design of a Batch Electrodialysis System for Domestic Desalination."** *International Desalination Association, World Congress on Water Reuse and Desalination*, São Paulo. IDA17WC-58064. Oct 15-20, 2017. **Awarded Best Oral and Written Paper Presented in the Technical Program in the Category of State-of-the-Art.**
2. Wright, N.C., Winter V, A.G. **"Model and Experimental Validation of a Spiral-Wound Electrodialysis Module."** *International Desalination Association, World Congress on Water Reuse and Desalination*, São Paulo. IDA17WC-57872. Oct 15-20, 2017.
3. Ramanujan, D., Wright, N., Truffaut, S., von Medeazza, G., Winter V, A.G. **"Sustainability Analysis of PV-Powered Electrodialysis Desalination for Safe Drinking Water in the Gaza Strip."** *International Desalination Association, World Congress on Water Reuse and Desalination*, São Paulo. IDAWC REF: 17WC-58045. Oct 15-20, 2017.
4. Bian, D., Watson, S.M., Wright, N.C., Shah, S., Peters, I. M., Ramanujan, D., Buonassisi T., Winter V, A.G. **"Cost-Optimization of Solar-Powered Electrodialysis Reversal Systems for Desalination in Rural India."** *International Desalination Association, World Congress on Water Reuse and Desalination*, São Paulo. IDAWC REF: 17WC-58067. Oct 15-20, 2017.
5. Buchman, M., Winter V, A.G. **"Investigating the Effect of Intake Manifold Size on the Transient Response of Single Cylinder Turbocharged Engines."** 13th International Conference on Engines and Vehicles. SAE Technical Paper 2017-24-0170, 2017. September 10 -14, 2017.
6. Wright, N.C., Winter V, A.G. **"Village-Scale Electrodialysis Desalination: Field Trial Validation."** ASME. IDETC/CIE, *Vol. 2B: 43rd Design Automation Conference (DAC)*: V02BT03A019. Paper # DETC2017-68410. August 6 - 9, 2017.
7. Prost, V., Olesnavage, K.M., Winter V, A.G. **"Design and Testing of a Prosthetic Foot Prototype with Interchangeable Custom Rotational Springs to Adjust Ankle Stiffness for Evaluating Lower Leg Trajectory Error, an Optimization Metric for Prosthetic Feet."** ASME. IDETC/CIE, *Vol. 5B: 41st Mechanisms and Robotics Conference (MR)*: V05BT08A015. Paper # DETC2017-67820. Aug. 6 - 9, 2017.
8. Narain, J., Winter V, A.G. **"Determination of Resistance Factor for Tortuous Paths in Drip Emitters."** ASME. IDETC/CIE, *Vol. 2B: 43rd Design Automation Conference (DAC)*: V02BT03A017. Paper # DETC2017-67895. August 6 - 9, 2017.
9. Nayar, K.G., Sundararaman, P., O'Connor, C.L., Schacherl, J.D., Heath, M.L., Gabriel, M.O., Shah, S.R., Wright, N.C., Winter V, A.G. **"Feasibility Study of an Electrodialysis System for In-Home Water Desalination in Urban India."** *Development Engineering*, Volume 2, 2017, Pages 38-46, ISSN 2352-7285.
10. Watson, S., Bian, D., Sahraei, N., Winter V, A.G., Buonassisi, T., Peters, I.M. **"Advantages of Operation Flexibility and Load Sizing for PV-Powered System Design."** *Solar Energy*. (*Accepted*)
11. Wright, N.C., Shah, S.R., Amrose, S.E., Winter V, A.G. **"A Robust Model of Brackish Water Electrodialysis Desalination with Experimental Comparison at Different Size Scales."** *Desalination*. (*In Review*)
12. Shah, S.R., Wright, N.C., Nepsky, P., Winter V, A.G. **"Cost-Optimal Design of a Batch Electrodialysis System for Domestic Desalination of Brackish Groundwater."** *Desalination*. (*In Review*)
13. Bian, D.W., Watson, S.M., Wright, N.C., Shah, S.R., Buonassisi, T., Ramanujan, D., Peters, I.M., Winter V, A.G. **"Optimization and Design of a Low-Cost, Village-Scale, Photovoltaic-Powered, Electrodialysis Reversal Desalination System for Rural India."** *Desalination*. (*In Review*)
14. Winter V, A.G., Govindarajan, V. **"Engineering Reverse Innovations: How to Create Global Products Out of Emerging-Market Constraints."** *Harvard Business Review*, July-August 2015. **Winner of the McKinsey Award - Best Article in HBR, 2015.**
15. Wright, N.C., Winter V, A.G. **"Justification for Community-Scale Photovoltaic-Powered Electrodialysis Desalination Systems for Inland Rural Villages in India."** *Desalination*, 352, 82-91. 2014.

SELECTED ORGANIZATION MEMBERSHIP

Pi Tau Sigma International Mechanical Engineering Honor Society	2012-Present
American Physical Society	2009-Present
American Society of Mechanical Engineers	2004-Present
Tau Beta Pi Engineering Honor Society	2003-Present