

MARK N. HORENSTEIN, Ph.D.
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Areas of Expertise

Analog and Digital Electronics, Power Electronics, Electric Power Systems, Applied Electromagnetics

Education

Massachusetts Institute of Technology Ph.D. Electrical Engineering 1978
(Electric Power Systems Engineering Laboratory)
Thesis Title: "Particle Contamination of High-Voltage DC Insulators"

University of California at Berkeley M.S. Electrical Engineering 1975
(Solid State Optics Laboratory)

Massachusetts Institute of Technology S.B. Electrical Engineering 1973

Employment History

Boston University

Professor, Dept. of Electrical and Computer Engineering*	2000 - 2020
Associate Chair for Undergraduate Programs - ECE Department	2011 - 2015
Associate Dean for Graduate Programs and Research, Engineering	1999 - 2007
Associate Professor, Dept. of Electrical and Computer Engineering	1985 - 2000
Assistant Professor, Dept. of Electrical and Computer Engineering	1979 - 1985
*Professor Emeritus as of 1/2021	

Spire Corporation

Research Scientist	1978 – 1979
High-Voltage Transmission Line Pulsed-Power Division	

Professional Affiliations

- Institute of Electrical and Electronic Engineers (IEEE) Life Fellow
- Electrostatics Society of America (Past President and Life Member)
- European Federation of Chemical Engineers, International Fellow in Electrostatics
- National Association of Radio and Telecommunications Engineers: Certified Electrostatic Discharge Engineer
- Registered Professional Engineer - Electrical (previously) Commonwealth of Massachusetts
- Journal of Electrostatics (Editor Emeritus; Editor for 14 years)

Current Research Activities

Self-Cleaning Solar Panels via Electrodynamic Screen: Modeling and Commercialization

Teaching Experience

Electric Circuits, Analog and Digital Electronics, Power Electronics, Engineering Design, Electromagnetics, Antennas and Propagation

Prior Expert Witness & Litigation Work in Which Testimony Given – Past 4 years

May 2021:

Analog Devices, Inc. vs. Xilinx, Inc.

Inter Partes Review No. IPR2020-01606

Request for Inter Partes Review of US Patent 7,280,590

Worked on behalf of Respondent Xilinx

Declaration, Deposition

Status: Pending

January 2021:

MAGicALL vs. Advanced Energy and Eaglerise

United States District Court, District of Colorado

1:17-cv-02582-DDD-NRN

Matter: Inductors for Energy Transfer

Worked on behalf of MAGicALL

Deposition

Status: Pending

December 2020:

Voltstar Technologies, Inc. vs. Superior Communications and AT&T Mobility, Inc.

United States District Court, Central District of California

2:19-CV-07355-JAK-E

Matter: Qi Wireless Charging Systems

Worked on behalf of Superior/ATT

Declaration, Deposition

Status: Ongoing

January 2020:

Bell Northern Research vs. Coolpad Technologies et. al.

United States District Court, District of Southern California

3:18-cv-01784-CAB-BLM

Matter: Mobile Phone Power Saving Features

Worked on behalf of Bell Northern Research

Opening Report, Product Testing, Rebuttal Report, Deposition

Status: Settled

January 2020:

Bell Northern Research vs. ZTE et. al.

United States District Court, District of Southern California

Matter: Mobile Phone Power Saving Features
Worked on behalf of Bell Northern Research
Opening Report, Product Testing, Rebuttal Report, Deposition
Status: Settled

January 2019:

SnapRays LLC v. AllTrade, Enstant, et al.
U.S. International Trade Commission - Inv. No. 337-TA-1124
Matter: Active Electric Cover Plates
Worked on behalf of Complainant SnapRays
Opening Report, Product Testing, Rebuttal Report, Deposition
Status: Appeared before the ITC. Settled

April 2018:

Lincoln Electric Company v. Harbor Freight Tools
U.S. District Court for Northern District of Ohio, Eastern Division
Case No. 1:17-cv-02329
Matter: Driving Circuits for Welding Machines
Worked on behalf of Defendant Harbor Freight
Opening Report, Product Testing, Rebuttal Report, Deposition
Status: Settled

July 2018

RB-TPG San Jose v Tyco Fire Products
U.S. District Court for the Northern District of California,
Case No: 5:17-cv-03655
Matter: RF Interference with Wireless Fire Alarm Systems
Worked on behalf of Plaintiff RB-TPG
Opening Report, Rebuttal Report, Deposition, Jury Trial
Status: Jury finding for Defendant

September 2018:

UPI v. Richtek Corp.
U.S. International Trade Commission Inv. No. 337-TA-698
Matter: Integrated Circuits for Power Applications
Worked on behalf of Richtek USA
Expert report, Rebuttal Report, Deposition, Testimony at ITC Hearing
Status: Decision in favor of Richtek

November 2018:

Broad Ocean LLC v. Nidec Corp
Request for *Inter Partes* Review of US Patent 7,990,092
Matter: Electric Motors for HVAC Control
Worked on Behalf of Patent Owner Nidec
Declaration, Deposition.
Status: Settled

Technical Consulting

Griswold Corporation Nov 2015 – Nov 2016

Electric Water Treatment Devices

WAVE Reaction Chamber Design Review

CSL Consulting/Harvard Business School Aug 2018

Evaluation of Electrostatic Fields on LED Screen

Research Grants (Under Boston University)

Development of Prototype Self-Cleaning Solar: Massachusetts Clean Energy Center
(Subject: Self-Cleaning Solar Collectors)

Self-Cleaning Solar Panels: US–Israel Binational Science Foundation
(Subject: Self-Cleaning Solar Collectors)

Enhancement of Optical Efficiency of CSP – U.S. Dept. of Energy
(Subject: Self-Cleaning Solar Collectors)

In-Air Electric-Field Sensor Circuit for Airborne Applications - U.S. Navy STTR Phase I: N68335-15-C-0271 via White River Technologies. (Subject: Electric Field-Mill UAV Sensor)

Compact Low-Power Driver for Deformable Mirror – NASA via Boston Micromachines
(Subject: High Voltage MEMS Driver for Adaptive Optics)

Publications

Books:

M. N. Horenstein, *Design Concepts for Engineers, 5thEd.*, Upper Saddle River, NJ: Prentice Hall, 2015.

M. N. Horenstein, *Microelectronic Circuits and Devices, 2nd Ed.* Upper Saddle River, NJ: Prentice Hall, 1995

Journals Articles and Conference Papers (partial list):

Bernard, A.A.R., Horenstein, M.N.; Mazumder, M.K., et al, Optimization of optical performance and dust removal efficiency of electrodynamic screen (EDS) films for improving energy-yield of solar collectors, 2018 IEEE 7th World Conference on Photovoltaic Energy Conversion (WCPEC) (A Joint Conference of 45th IEEE PVSC,

28th PVSEC & 34th EU PVSEC), p 3451-4, 2018

Morales, C., Horenstein, M.; Mazumder, M., et al, Field-evaluation of electrodynamic screens for maintaining high optical efficiency operation of solar collectors 2017 IEEE 44th Photovoltaic Specialist Conference (PVSC), p 2870-4, 2017

Mazumder, M.K., Horenstein, M.N.; Sayyah, A.; et al, Mitigation of dust impacts on solar collectors by water-free cleaning with transparent electrodynamic films: Progress and challenges 2017 IEEE 44th Photovoltaic Specialist Conference (PVSC), p 6 pp., 2017

Sayyah, A., Crowell, D.R.; Raychowdhury, A., Horenstein, M.N. ; Mazumder, M.K. , "An experimental study on the characterization of electric charge in electrostatic dust removal", *Journal of Electrostatics*, June 2017, pgs. 173-9

Sayyah A, Horenstein MN, Mazumder MK, Ahmadi G, "Electrostatic Force Distribution on an Electrodynamic Screen," *Journal of Electrostatics* 81:24-36 Jun 2016

Sayyah A, Horenstein MN, Mazumder MK, "A Comprehensive Analysis of the Electric Field Distribution in an Electrodynamic Screen," *Journal of Electrostatics* 76:115-126 Aug 2015

Mazumder MK, Stark JW, Heiling C, Liu M, Bernard A, Horenstein MN, Garner S, Lin HY, "Development of Transparent Electrodynamic Screens on Ultrathin Flexible Glass Film Substrates for Retrofitting Solar Panels and Mirrors for Self-Cleaning Function," *MRS Advances* 1(15):1003-1012 2016

Dai S, Knepper RW, Horenstein MN, "300-V LDMOS Analog-Multiplexed Driver for MEMS Devices," *IEEE Transactions On Circuits And Systems I-Regular Papers* 62(12):2806-2816 Dec 2015

A. Sayyah, M.N. Horenstein, M.K. Mazumder, "Energy yield loss caused by dust deposition on photovoltaic panels", *Solar Energy*, v 107, p 576-604, Sept. 2014.

M. N. Horenstein, M. K. Mazumder, R. C. Sumner, J.W. Stark, T. Abuhamed, R. Boxman, "Modeling of trajectories in an electrodynamic screen for obtaining maximum particle removal efficiency", *IEEE Transactions on Industry Applications*, v 49, n 2, p 707-13, March-April 2013.

Klausner, A., Trachtenberg, A.; Starobinski, D.; Horenstein, M., "An Overview of the Capabilities and Limitations of Smartphone Sensors", *Int.. Jour of Handheld Computing Research*, v 4, n 2, p 69-80, April-June 2013

Mazumder, M. Horenstein, M.N.; Stark, J.W.; Girouard, P.; Sumner, R.; Henderson, B.; Sadder, O.; Hidetaka, I.; Biris, A.S.; Sharma, R., "Characterization of Electrodynamic Screen Performance for Dust Removal from Solar Panels and Solar Hydrogen Generators", *IEEE Transactions on Industry Applications*, v 49, n 4, p 1793-800, July-

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