
Saeid Bashash, Ph.D.

Assistant Professor
Mechanical Engineering Department
San José State University

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Professional Experience**Assistant Professor, (Aug. 2015-Present)**

Department of Mechanical Engineering, San José State University
Research Areas: *Mechatronics, Energy Systems, and Control*

Senior Control Engineer (Jan. 2013-Aug. 2015)

HGST, a Western Digital company, San José, CA

Topics: *Robust control optimization for high-performance track following in hard disk drives*
Optimal track-seeking control for the enterprise-class hard disk drives

Postdoctoral Research Fellow (Jan. 2011-Dec. 2012)

Pennsylvania State University, University Park, PA

Topics: *Electrochemical battery systems modeling, estimation, and control*
Optimal energy management in hybrid power systems
Demand response and smart grid energy management

Advisor: Professor Hosam K. Fathy

Postdoctoral Research Fellow (Jan. 2009-Dec. 2010)

University of Michigan, Ann Arbor, MI

Topic: *Battery health-conscious optimization of vehicle-to-grid (V2G) system*

Advisor: Professor Hosam K. Fathy

Education**Ph.D., Mechanical Engineering (Dec. 2008)**

Clemson University, Clemson, SC

Dissertation: *Modeling and control of piezoelectric micro and nano systems*

Advisor: Professor Nader Jalili

Committee: Professor Thomas Kurfess, Professor Darren Dawson, and Professor Ardalan Vahidi

M.Sc., Mechanical Engineering (Dec. 2005)

Clemson University, Clemson, SC

Thesis: *Nonlinear modeling and control of piezoelectrically-driven nanostagers*

Advisor: Professor Nader Jalili

B.S., Mechanical Engineering (Feb. 2004)

Sharif University of Technology, Tehran, Iran

Research Interests

Control Systems Analysis and Design, Mechatronics, Vibration Control, Sliding Mode Control, Adaptive Control, Robust Control Optimization, State and Parameter Estimation, Convex Optimization, Dynamic Programming, Hybrid Switching Systems, Micro and Nano Positioning Systems, Electrochemical Energy Storage Systems, Vehicle Electrification, Economic Demand Response, and Smart Grid Energy Management.

Publications

(A) Patents

- 1- Horwitz, J., Kirn C., **Bashash, S.**, Olson, A., Akella, R. D., and Awad, O., “System and method for a smart faucet,” US Patent US20170260722A1, 3/12/2019.

(B) Peer-Reviewed Journal Papers

- 2- **Bashash S.**, and Lun-Lee K., “Automatic coordination of internet-connected thermostats for power balancing and frequency control in smart microgrids,” *Energies*, **12**, 1936, 2019.
- 3- **Bashash S.**, and Shariat S., “Performance enhancement of hard disk drives through data-driven control design and population clustering”, *Precision Engineering*, **56**, pp. 267-279, 2019.
- 4- **Bashash S.**, “Cost-optimal coordination of interacting HVAC loads in buildings,” *ASME Journal of Dynamic Systems, Measurement, and Control*, **140**, 044501, 2017.
- 5- **Bashash S.** and Fathy H. K., “Cost-optimal charging of plug-in hybrid electric vehicles under time-varying electricity price signals,” *IEEE Transactions on Intelligent Transportation Systems*, **15**, 1958-1968, 2014.
- 6- **Bashash S.** and Fathy H. K., “Modeling and control of aggregate air conditioning loads for robust renewable power management,” *IEEE Transactions on Control Systems Technology*, **21**, 1318-1327, 2013.
- 7- **Bashash S.** and Fathy H. K., “Transport-based load modeling and sliding mode control of plug-in electric vehicles for robust renewable power tracking”, *IEEE Transactions on Smart Grid*, **3**, pp. 526-534, 2012.
- 8- **Bashash S.**, Saeidpourazar R., and Jalili N., “Supervisory hybrid control of piezoelectric actuators utilized in tracking piecewise continuous trajectories,” *Precision Engineering*, **35**, pp. 566-573, 2011.
- 9- **Bashash S.**, Moura S. J., and Fathy H. K., “On the aggregated grid load imposed by battery health-conscious charging of plug-in hybrid electric vehicles”, *Journal of Power Sources*, **196**, pp. 8747-8754, 2011.
- 10- Forman J. C., **Bashash S.**, Stein J. L., and Fathy H. K., “Reduction of an electrochemistry-based Li-ion battery degradation model via constraint linearization and Padé approximation”, *Journal of the Electrochemical Society*, **158**, pp. A93-A101, 2011.
- 11- Moura S. J., Forman J. C., **Bashash S.**, Stein J. L., and Fathy H. K., “Optimal control of film growth in lithium-Ion battery packs via relay switches”, *IEEE Transactions on Industrial Electronics*, **58**, pp. 3555-3566, 2011.
- 12- **Bashash S.**, Moura S. J., Forman J. C., and Fathy H. K., “Plug-in hybrid electric vehicle charge pattern optimization for energy cost and battery longevity”, *Journal of Power Sources*, **196**, pp. 541-549, 2011.
- 13- **Bashash S.**, Vora K., Jalili N., “Distributed-parameters modeling and control of rod-type solid-state actuators”, *Journal of Vibration and Control*, **17**, 813-825, 2011.
- 14- **Bashash S.**, Saeidpourazar R., and Jalili N., “Development, analysis, and control of a high-speed laser-free atomic force microscope,” *Review of Scientific Instruments*, **81**, pp. 023707-1:9, 2010.
- 15- **Bashash S.**, Jalili N., Evans P., and Dapino M. J., “Recursive memory-based hysteresis modeling for solid-state smart actuators,” *Journal of Intelligent Materials, Systems, and Structures*, **20**, pp. 2161-2171, 2009.
- 16- Salehi-Khojin A., **Bashash S.**, Jalili N., Thompson G. L., and Vertegel A., “Modeling piezoresponse force microscopy for low-dimensional material characterization: Theory and experiment”, *Journal of Dynamic Systems Measurement and Control*, **131**, pp. 061107-1:7, 2009.
- 17- **Bashash S.**, Salehi-Khojin A., Jalili N., Thompson G. L., Vertegel A., Müller M., and Berger R., “Mass detection of elastically-distributed ultrathin layers using piezoresponse force microscopy,” *Journal of Micromechanics and Microengineering*, **19**, pp. 025016.1-025016.9, 2009.

- 18- Salehi-Khojin A., **Bashash S.**, Jalili N., and Berger R., “Nanomechanical cantilever Active Probes for ultrasmall mass detection”, *Journal of Applied Physics*, **105**, pp. 013506-013506-8, 2009.
- 19- **Bashash S.** and Jalili N., “Robust adaptive control of coupled parallel piezo-flexural nanopositioning stages,” *IEEE/ASME Transactions on Mechatronics*, **14**, pp. 11-20, 2008.
- 20- Salehi-Khojin A., **Bashash S.**, and Jalili N., “Modeling and experimental vibration analysis of nanomechanical cantilever active probes”, *Journal of Micromechanics and Microengineering*, **18**, pp. 085008, 2008.
- 21- **Bashash S.** and Jalili N., “A polynomial-based linear mapping strategy for compensation of hysteresis in piezoelectric actuators,” *ASME Transactions, Journal of Dynamic Systems, Measurements and Control*, **130**, pp. 031008 (1-10), 2008.
- 22- **Bashash S.** and Jalili N., “Robust multiple-frequency trajectory tracking control of piezoelectrically-driven micro/nano positioning systems,” *IEEE Transactions on Control Systems Technology*, **15**, pp. 867-878, 2007.
- 23- **Bashash S.** and Jalili N., “Intelligent rules of hysteresis in feedforward trajectory control of piezoelectrically-driven nanostagers,” *Journal of Micromechanics and Microengineering*, **17**, pp. 342-349, 2007.
- 24- **Bashash S.** and Jalili N., “Underlying memory-dominant nature of hysteresis in piezoelectric materials,” *Journal of Applied Physics*, **100**, pp. 014103, 2006.

(B) Conference Papers and Presentations

- 25- Kumbhani N. and **Bashash S.**, "A supervisory lateral slip prevention controller for autonomous vehicles", *Proceedings of 2019 ASME Dynamic Systems and Control Conference*, Park City, UT, Oct. 2019.
- 26- **Bashash S.**, Shariat S., “Clustering-Based Control Optimization of Hard Disk Drive Servo System for Population-Level Performance Enhancement,” to appear, *Proceedings of 2019 American Control Conference*, Philadelphia, July 2019.
- 27- Abbaszadeh-Chekan J., **Bashash S.**, and Taheri, S., “A Data-driven Control Strategy for Trip Length-Conscious Power Management of Plug-in Hybrid Electric Vehicles,” *Proceedings of the IEEE Conference on Control Technology and Applications*, Copenhagen, Denmark, August 2018.
- 28- **Bashash S.**, “Tradeoffs in Anti-aliasing Notch Filter Design for Multi-rate Digital Servo Systems,” *Proceedings of the 2018 American Control Conference*, Milwaukee, WI, June 2018.
- 29- Chan K. and **Bashash S.**, “Modeling and energy cost optimization of air conditioning loads in smart grid environments,” *Proceedings of the 2017 ASME Dynamic Systems and Control Conference*, Tysons Corner, VA, Oct 2017.
- 30- Mounesisohi A. and **Bashash S.**, “Vibration compensation of display contents in smart devices using accelerometer feedback,” *Proceedings of the 1st IEEE Conference on Control Technology and Applications*, Kohala Coast, HI, August 2017.
- 31- Abbaszadeh-Chekan J. and **Bashash S.**, “Dynamic programming-based approximate real-time control policies for the plug-in hybrid electric vehicles,” *Proceedings of the 1st IEEE Conference on Control Technology and Applications*, Kohala Coast, HI, August 2017.
- 32- Abbaszadeh-Chekan J. and **Bashash S.**, “IoT-oriented demand-side energy management of thermostatically-controlled loads,” *Proceedings of the 2017 American Control Conference*, Seattle, WA, May 2017.
- 33- Guo Y. and **Bashash S.**, “Analyzing the impacts of plug-in EVs on the California power grid using quadratic programming and fixed-point iteration,” *Proceedings of the 2017 American Control Conference*, Seattle, WA, May 2017.

- 34- **Bashash S.**, “Cost-optimal coordination of interacting household appliances under time-varying electricity price signals,” *Proceedings of the 2016 ASME Dynamic Systems and Control Conference*, Minneapolis, MN, Oct 2016.
- 35- **Bashash S.**, “Robust control optimization for high performance track following in hard disk drives,” *Proceedings of the 2015 American Control Conference*, Chicago, IL, Jul 2015.
- 36- **Bashash S.** and Fathy H. K., “Battery state of health and charge estimation using polynomial chaos theory,” *Proceedings of 2013 ASME Dynamic Systems and Control Conference*, Stanford University, Palo Alto, CA, Oct 2013.
- 37- **Bashash S.** and Fathy H. K., “Optimizing demand response of plug-in hybrid electric vehicles using quadratic programming,” *Proceedings of 2013 American Control Conference*, Washington DC, Jun 2013.
- 38- **Bashash S.** and Fathy H. K., “Power grid stabilization through setpoint temperature control of frequency-responsive air conditioning loads,” *Proceedings of 2012 ASME Dynamic Systems and Control Conference*, Fort Lauderdale, FL, Oct 2012.
- 39- **Bashash S.** and Fathy H. K., “Robust demand-side plug-in electric vehicle load control for renewable energy management” *Proceedings of 2011 American Control Conference*, Jun-Jul 2011, San Francisco, CA.
- 40- **Bashash S.** and Fathy H. K., “Modeling and control insights into demand-side energy management through set-point control of thermostatic loads,” *Proceedings of 2011 American Control Conference*, Jun-Jul 2011, San Francisco, CA.
- 41- Forman J. C., **Bashash S.**, Stein J. L., and Fathy H. K., “Reduction of an electrochemistry-based Li-ion battery degradation model via constraint linearization and Pade approximation”, *Proceedings of 2010 ASME Dynamic Systems and Control Conference*, Sep 2010, Cambridge, MA.
- 42- **Bashash S.**, Moura S. J., Fathy H. K., “Battery health-conscious plug-in hybrid electric vehicle power demand prediction,” *Proc. of 2010 ASME Dynamic Systems and Control Conference*, Cambridge, MA.
- 43- **Bashash S.**, Moura S. J., and Fathy H. K., “Charge trajectory optimization of plug-in hybrid electric vehicles for energy cost reduction and battery life enhancement,” *Proceedings of 2010 American Control Conference*, Jun-Jul 2010, Baltimore, MD.
- 44- **Bashash S.**, Saeidpourazar R., and Jalili N., “Development of high-speed laser-free atomic force microscopy”, *Proceedings of 2009 ASME Dynamic Systems and Control Conference*, Oct 2009, Hollywood, CA.
- 45- **Bashash S.**, Salehi-Khojin A., Jalili N., Thompson G. L., Vertegel A., Müller M., and Berger R., “Stiffness and mass detection of nano layers using piezoresponse force microscopy,” *Proceedings of 2009 Design Engineering Technical Conferences*, Sep 2009, San Diego, CA.
- 46- **Bashash S.**, Saeidpourazar R., Jalili N., “Tracking control of time-varying discontinuous trajectories with application to probe-based imaging and nanopositioning,” *Proceedings of 2009 American Control Conference*, Jun 2009, St. Louis, MO.
- 47- Salehi-Khojin A., **Bashash S.**, Jalili N., Thompson G. L., and Vertegel A., “Detection of local stiffness and piezoelectric properties of materials via piezoresponse force microscopy,” *Proceedings of 2009 American Control Conference*, Jun 2009, St. Luis, MO.
- 48- **Bashash S.**, Vora K., Jalili N., Evans P. G., and Dapino M., “Modeling major and minor hysteresis loops in Galfenol-driven micropositioning actuators using a memory-based hysteresis framework,” *Proceedings of 1st ASME Dynamic Systems and Control Conference*, Oct 2008, Ann Arbor, MI.
- 49- Vora K., **Bashash S.**, Jalili N., “Distributed parameters modeling of rod-like solid-state actuators,” *Proceedings of 1st ASME Dynamic Systems and Control Conference*, Oct 2008, Ann Arbor, MI.

- 50- Salehi-Khojin A., **Bashash S.**, and Jalili N., “Modeling and experimental vibration analysis of Nanomechanical cantilever active probes”, *Proceedings of 1st ASME Dynamic Systems and Control Conference*, Oct 2008, Ann Arbor, MI.
- 51- **Bashash S.**, Salehi-khojin A., and Jalili N., “Forced vibration analysis of flexible Euler-Bernoulli beams with geometrical discontinuities,” *Proc. of 2008 American Control Conference*, Jun 2008, Seattle, WA.
- 52- **Bashash S.** and Jalili N., “Adaptive robust control strategy for coupled parallel-kinematics piezo-flexural micro and nano-positioning stages,” *Proceedings of 2007 International Mechanical Engineering Congress and Exposition*, Nov 2007, Seattle, WA.
- 53- **Bashash S.**, Ayalew B., and Jalili N., “ μ -synthesis control of systems with unknown hysteresis nonlinearity and parametric uncertainties”, *Proceedings of 2007 ASME International Design Engineering Technical Conferences*, Sep 2007, Las Vegas, NV.
- 54- **Bashash S.** and Jalili N., “Feedforward multiple-frequency trajectory tracking control of piezoelectrically-driven systems,” *Proceedings of 2007 American Control Conference*, Jun 2007, New York City, NY.
- 55- **Bashash S.** and Jalili N., “Modeling and feedforward control of a 2-DOF parallel kinematics nano-positioning stage,” *Proceedings of 14th SPIE Annual Symposium on Smart Structures and Materials*, Mar 2007, San Diego, CA.
- 56- **Bashash S.** and Jalili N., “A new constitutive modeling and control paradigm for piezoelectrically-actuated nanostagers,” *Proceedings of 2006 International Mechanical Engineering Congress and Exposition*, Nov 2006, Chicago, IL.
- 57- **Bashash S.** and Jalili N., “On the nonlinear modeling, system identification, and control of piezoelectrically-driven nanostagers,” *10th Int. Conference on New Actuators*, Jun 2006, Bremen, Germany.
- 58- **Bashash S.** and Jalili N., “Real-time identification of piezoelectric actuator nonlinearities with application to precision trajectory control,” *Proc. of 2006 American Control Conference*, Jun 2006, Minneapolis, MN.
- 59- **Bashash S.** and Jalili N., “Adaptive sliding controller design for piezoelectric actuators with parametric uncertainty and unknown hysteresis nonlinearity,” *2006 ASME Student Conference*, May 2006, Istanbul, Turkey.
- 60- **Bashash S.** and Jalili N., “Feedforward hysteresis compensation in trajectory control of piezoelectrically-driven nanostagers,” *Proceedings of 13th SPIE Annual Symposium on Smart Structures and Materials*, Feb-Mar 2006, San Diego, CA.
- 61- **Bashash S.** and Jalili N., “A new hysteresis model for piezoelectric actuators with application to precision trajectory control,” *Proceedings of 2005 International Mechanical Engineering Congress and Exposition*, Nov 2005, Orlando, FL.
- 62- **Bashash S.** and Jalili N., “Trajectory control of piezoelectric actuators using nonlinear variable structure control,” *Int. Symposium on Collaborative Research in Applied Science*, Oct 2005, Vancouver, CA.

Grants & Awards

- Research Grant by CU Aerospace (Mar 2018)
- Kordestani Research Professor Award by SJSU College of Engineering (Jan 2018)
- Research Grant by Western Digital Corporation (Dec 2018)
- Research and Development Grant by Flowe.Green LLC (Jan 2016)
- Kordestani Research Professor Award by SJSU College of Engineering (Jan 2016)
- Faculty Mini Grant by SJSU College of Engineering (Oct 2015)
- Best Paper Finalist, 2013 ASME Dynamic Systems and Control Conference, Palo Alto, CA (Oct 2013)
- Best Presentation in Session, 2011 American Control Conference, San Francisco, CA (Jun 2011)

- 3rd Place (among 52 participants), 4th Annual Postdoctoral Research Exhibition, Penn State Univ. (Apr 2011)
- Best Presentation in Session, 2009 American Control Conference, St. Louis, MO (Jun 2009)
- Endowed Teaching Fellowship, Clemson University, Mechanical Engineering Department (Nov 2007)
- Best Student Paper Finalist , 2007 ASME IMECE, DSC Division, Seattle, WA (Nov 2007)
- Distinguished Ph.D. Performance Fellowship , Clemson University Graduate School (Feb 2007)
- Best Student Paper Finalist , 2006 ASME IMECE, DSC Division, Chicago, IL (Nov 2006)
- Outstanding Masters Student Award , Clemson University, Mechanical Engineering Department (Apr 2006)
- Best Performance in International Music Festival, Clemson University (Apr 2005)

Teaching Experience

- SJSU, ME 285: Mechatronic Systems Engineering (Fall 2019)
- SJSU, ENGR 261: Battery Technologies I (Spring 2019)
- SJSU, ME 296N: Applied Nonlinear Control (Spring 2018)
- SJSU, ME 281: Advanced Control System Design (Spring 2017, 19)
- SJSU, ME 280: Automatic Control Engineering (Fall 2016)
- SJSU, ME 190: Mechatronic Systems Design (Fall 2016, 17, 18, 19)
- SJSU, ME 101: Dynamics (Fall 2015, Spring 2016)
- Clemson, ME 305: Modeling and Analysis of Dynamic Systems (Fall 2008)

Professional Membership and Services

- American Society of Mechanical Engineers (ASME)** (2005-present)
Dynamic Systems and Control Division (DSCD)
- Institute of Electrical and Electronics Engineers (IEEE)** (2010-2013)
Control Systems Society (CSS)
- Member of Executive Committee**, Penn State Postdoctoral Society (Fall 2011)
- Member of Program Committee**, 2009 Dynamic Systems and Control Conference, Hollywood, CA (Oct 2009)
- Session Co-chair**, 2016 Dynamic Systems and Control Conference, Minneapolis, MN (Oct 2016)
- Session Co-chair**, 1st IEEE Conference on Control Technology and Applications, Kohala Coast, HI (Aug 2017)
- Session Co-chair**, 2018 American Control Conference, Milwaukee, WI (Jun 2018)
- Reviewer**, Advanced Research Projects Agency-Energy (ARPA-E) Concept Papers, NEXTCAR Prog. (Jun 2016)
- Reviewer for:** Transportation Science, International Journal of Powertrains, International Design Engineering Technical Conferences, International Journal of Electrical Power & Energy Systems, ASME Journal of Dynamic Systems, Measurements and Control, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, IEEE Transactions on Systems, Man, and Cybernetics, IEEE Transaction on Control Systems Technology, IEEE Transactions on Industrial Electronics, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Automatic Control, IEEE Transactions on Power Systems, IEEE Transactions on Smart Grid, Mechatronics, American Control Conference, ASME Dynamic Systems and Control Conference, IEEE Multi-conference on Systems and Control, International Mechanical Engineering Congress and Exposition, IEEE Conference on Decision and Control, and IFAC World Congress