

## EDUCATION

PhD in Electrical and Computer Engineering Carnegie Mellon University, Pittsburgh, PA Dissertation title: “Dielectric Charging in CMOS MEMS”	2013
MS in Electrical and Computer Engineering Carnegie Mellon University, Pittsburgh, PA	2011
BS in Electrical and Computer Engineering Olin College of Engineering, Needham, MA	2007

## ACADEMIC APPOINTMENTS

Associate Professor, Department of Electrical and Computer Engineering and Department of Physical Therapy, Movement, and Rehabilitation Sciences, Northeastern University, Boston, MA	2021–Present
Dr. Martin Luther King, Jr, Visiting Associate Professor, Media Arts and Sciences, MIT, Cambridge, MA	2021–2022
Associate Professor of Engineering Picker Engineering Program, Smith College, Northampton, MA	2021
Assistant Professor of Engineering Picker Engineering Program, Smith College, Northampton, MA	2015–2021
Visiting Scholar Wyss Institute, Harvard University, Cambridge, MA	2018–2021
UC President’s Postdoctoral Fellow, PRIME Systems Laboratory University of California, San Diego, San Diego, CA	2014–2015
UC Berkeley Chancellor’s Postdoctoral Fellow, PRIME Systems Laboratory University of California Berkeley, Berkeley, CA	2013–2014

## EXTERNAL FUNDING AWARDED

Total: \$791,972  
PI Dorsey awarded: \$791,972

A4	Amazon Robotics, “Rapid and soft tactile sensors using conductive buckled beams,” 12/21/2021, <b>\$250,000</b> , sole PI
A3	National Science Foundation, “CAREER: Rigidity tuned elastomer origami tessellations for fast, reconfigurable, and soft mechanoreceptors,” 1846954, 02/19/2019–01/31/2024, <b>\$500,404</b> , sole PI
A2	Dassault Foundation, “Introducing modern simulation and modeling software alongside the Engineering Mechanics classroom,” 07/01/2020–06/30/2021, <b>\$26,568</b> , sole PI
A1	Center for Nanoscale Systems (CNS), Harvard University, in-kind support for nanofabrication facility use ( <b>approx. \$15,000</b> ), 07/01/2018–05/31/2020, sole PI

## INTERNAL FUNDING AWARDED

Total: \$9,270  
PI Dorsey awarded: \$9,270

Jean Picker Faculty Fellowship, Smith College, 07/01/2020– 06/30/2021, <b>\$8,045</b> , sole PI
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Jean Picker Faculty Fellowship, Smith College, 07/01/2019– 06/30/2019, (teaching release)  
Design Thinking Curriculum Grant, Smith College, 07/01/2017–06/30/2018, \$1,225, sole PI

#### FELLOWSHIPS, HONORS, AND AWARDS

Dr. Martin Luther King, Jr. Fellowship, Massachusetts Institute Technology	2021–2022
Presidential Award for Mentoring, Smith College	2021
Jean Picker Faculty Fellowship, Smith College	2018, 2020
Center for Nanoscale Systems (CNS) Scholar, Harvard University	2018
Angel G. Jordan Award for Academic Excellence and Service to the ECE Department, Carnegie Mellon University	2014
Univ. of California President’s Postdoctoral Fellowship, UC San Diego	2014
Univ. of California Chancellor’s Postdoctoral Fellowship, UC Berkeley	2013
Neil and Jo Bushnell Fellowship in Engineering, Carnegie Mellon University	2012
GEM PhD Engineering Fellowship	2008

#### JOURNAL ARTICLES

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author

- J6 K.L. Dorsey and N. Lazarus, “Lifetime of liquid metal wires for stretchable platforms,” *Advanced Materials Technologies*, no. 4, vol. 6, 2021.
- J5 O.A. Araromi, M.A. Graule, K.L. Dorsey, S. Castellanos, J.R. Foster, W.H. Hsu, J.J. Vlassak, W.H. Hsu, A.E. Passy, J.J. Vlassak, J.C. Weaver, C.J. Walsh, R.J. Wood, “Ultra-sensitive and resilient compliant strain gauges for soft machines,” *Nature*, no. 587, pp. 219–224, 2020.
- J4 K.L. Dorsey, M. Cao\*, G.A. Slipper, and N. Lazarus, “Mechanical isolation and temperature compensation in soft elastomer components,” *IEEE Sensors Journal*, vol. 18, no. 18, 2018.
- J3 D.A. Rolfe, K.L. Dorsey, J.C. Cheng, and A.P. Pisano, “A surface acoustic resonator with template-patterned interdigitated fingers,” *Sensors and Actuators A: Physical*, vol. 248, pp. 73-77, 2016.
- J2 K.L. Dorsey and A.P. Pisano, “Stability and Control of a Metal Oxide Gas Sensor Under Air Flow,” *IEEE Sensors Journal*, vol. 16, no. 3, 2016.
- J1 K.L. Dorsey, S.S. Bedair, and G.K. Fedder, “Gas chemical sensitivity of a CMOS MEMS cantilever functionalized by evaporative assembly,” *Journal of Micromechanics and Microengineering*, vol. 24, no. 7, 2014.

#### CONFERENCE PAPERS

(A) Full paper review  
(B) 2-page abstract review  
(C) Other

- C10 K.L. Dorsey, “Reconfigurable Soft Capacitor with Variable Stiffness Ring,” in Proc. IEEE RoboSoft Conf., Seoul, Korea, 2019. (A)
- C9 K.L. Dorsey, M. Cao\*, and N. Lazarus, “Mechanical Isolation Structures for Soft Elastomer Components,” in Proc. IEEE Sensors Conf., Glasgow, UK, 2017. (B)

- C8 N. Terasaki, K.L. Dorsey, M. Makihata, and A.P. Pisano, "Micro printing using microfluidics for printed biodegradable devices in trillion sensing," in ECS Trans., 2017. (C)
- C7 D.A. Rolfe, K.L. Dorsey, and A.P. Pisano, "A model to guide template-based nanoparticle printing development," in Proc. ASME Intl. Conf. on Nanochannels, Microchannels, and Minichannels, San Francisco, USA, 2015. (A)
- C6 M.M. Makihata, B.Eovino, X. Jiang, A. Toor, K.L. Dorsey, and A.P. Pisano, "Non-invasive and remote pipeline rehabilitation technology using reactive and magnetic particles," ACSE Pipelines Conf., Baltimore, USA, 2015. (C)
- C5 K.L. Dorsey, D.A. Rolfe, G.D. Hoople, and A.P. Pisano, "Functionalized micromolded nanoparticles towards gas sensor arrays," in Proc. IEEE Sensors Conf., Valencia, Spain, 2014. (B)
- C4 K.L. Dorsey, J.R. Herr, and A.P. Pisano, "Sensor selection for outdoor air quality monitoring," in Proc. Next-Generation Robots and Systems SPIE Sensing Technology+Applications Conf., Baltimore, USA, 2014. (C)
- C3 K.L. Dorsey and G.K. Fedder, "A test structure to inform the effects of dielectric charging on CMOS MEMS inertial sensors," in Proc. IEEE Microelectromechanical Systems Conf., Paris, France, 2012. (B)
- C2 K.L. Dorsey and G.K. Fedder, "A Frenkel-Poole model of dielectric charging in CMOS MEMS," in Proc. Solid State Sensors, Actuators, and Microsystems Conf., Beijing, China, 2011. (B)
- C1 K.L. Dorsey and G.K. Fedder, "Dielectric charging effects in electrostatically actuated CMOS MEMS resonators," in Proc. IEEE Sensors Conf., Kona, USA, 2010. (B)

#### CONFERENCE AND WORKSHOP PRESENTATIONS

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| P12 | "An origami-patterned, flexible pressure sensor fabricated with vacuum forming," Materials Research Society Fall Meeting, Boston, USA                     | 2019 |
| P11 | "Reconfigurable soft capacitor with variable stiffness ring," IEEE RoboSoft Conference, Seoul, Korea  | 2019 |
| P10 | "Reconfigurable soft capacitor," Southwestern Robotics Symposium, Tempe, USA  | 2019 |
| P9  | "A strain isolated capacitor in a hyper-elastic substrate," Academic and Research Leadership Network Faculty Development Symposium, Pittsburgh, USA       | 2018 |
| P8  | "Mechanical isolation structures for soft elastomer components," IEEE Sensors Conf., Glasgow, UK  | 2017 |
| P7  | "A strain isolated capacitor in a hyper-elastic substrate," Material Robotics Workshop, Robotics: Science and Systems Conference, Cambridge, USA          | 2017 |
| P6  | "The effect of airflow on metal oxide gas chemical sensor stability," Academic and Research Leadership Network Faculty Development Symposium, Boston, USA | 2016 |
| P5  | "Functionalized micromolded nanoparticles towards gas sensor arrays," IEEE Sensors Conf., Valencia, Spain   | 2014 |

P4	“Sensor selection for outdoor air quality monitoring,” SPIE Sensing Technology and Applications Conference, Baltimore, USA	2014
P3	"A test structure to inform the effects of dielectric charging on CMOS MEMS inertial sensors," IEEE MEMS, Paris, France	2012
P2	"A Frenkel-Poole model of dielectric charging in CMOS MEMS," Solid State Sensors, Actuators, and Microsystems Conference (TRANSDUCERS), Beijing, China	2011
P1	"Dielectric charging effects in electrostatically actuated CMOS MEMS resonators," IEEE Sensors, Kona, USA	2010

#### INVITED SEMINARS AND COLLOQUIA (SELECTED)

T24	“Challenges and opportunities in designing tunable, soft mechanical sensors,” UMass Amherst Robotics Seminar Series	2021
T23	“It’s a bit of a stretch,” Engineering Department Seminar, Hope College	2021
T22	“Reconfigurable Sensing,” Expert Panelist, NSF-NIH Smart Health Principal Investigators meeting	2021
T21	“Challenges and opportunities in designing tunable, soft mechanical sensors,” Toyota Research Institute	2021
T20	“Challenges and opportunities in designing tunable, soft mechanical sensors”, Robotics Institute/Mechanical Engineering/Electrical and Computer Engineering joint seminar, Carnegie Mellon University	2021
T19	“Challenges and opportunities in designing tunable, soft mechanical sensors,” Robotics Engineering Colloquium, Worcester Polytechnic Institute	2021
T18	“Challenges and opportunities in designing tunable, soft mechanical sensors,” Electrical and Computer Engineering Seminar, Northeastern University	2021
T17	“Soft, shape, sense,” Department of Mechanical Engineering, Johns Hopkins University	2020
T16	“Soft, shape, sense,” Department of Mechanical and Materials Engineering, Florida International University	2020
T15	“Soft, shape, sense,” Sung, Yang, and Kod* Labs, University of Pennsylvania	2020
T14	“Soft, shape, sense,” Electrical and Computer Engineering department, Duke University	2020
T13	“Soft, shape, sense,” Safer-at-home Seminar Series: Materials Science and Engineering Virtual Research and Networking, NC State University	2020
T12	“What’s hard about soft sensors?” Electrical and Computer Engineering Colloquium, Tufts University	2019
T11	“It's a bit of a stretch: selective, flexible mechanical sensors,” Mechanical Engineering Seminar, University of Connecticut, Storrs	2019
T10	“It's a bit of a stretch: selective, flexible mechanical sensors,” joint ME/ECBE/CS Seminar, Union College	2019

T9	“It's a bit of a stretch: selective, flexible mechanical sensors,” Physics Seminar, Mount Holyoke College	2019
T8	“What’s hard about soft sensors?” MOSIS Distinguished Lecturer Seminar, University of Connecticut, Storrs	2019
T7	“What’s hard about soft sensors?” Valve, L.L.C., Bellevue, WA	2019
T6	“What’s hard about soft sensors?” Sigma Xi, Smith College	2018
T5	“Strain isolation in elastomer-based capacitors,” National Institute of Standards and Technology, Gaithersburg, MD	2018
T4	“Strain isolation in elastomer-based capacitors,” Sensors and Electron Devices Directorate, Army Research Laboratory, Adelphi, MD	2017
T3	“Sensor in the wind: improving metal oxide sensor stability in airflow,” Materials Science and Engineering and Mechanical Engineering Seminar Series, Boston University	2016
T2	“Metal oxide sensor stability in airflow,” UC Berkeley	2014
T1	“Metal oxide sensor stability in airflow,” UC Los Angeles	2014

## PATENTS

Pa1	US 9,150,402, “MEMS Devices Utilizing a Thick Metal Layer of an Interconnect Metal Film Stack,” R. Mahameed, K.L. Dorsey, M.O. Abdelmejeed, M. Abdelmoneum, 2015
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## PROFESSIONAL LEADERSHIP POSITIONS

Early Career Researcher Board Member, IOP Multifunctional Materials journal	2021–Present
Boston Regional Leader, Black in Robotics	2021–Present
Symposium Co-organizer, “From Actuators and Energy Harvesting Storage Systems to Living Machines,” Materials Research Society Spring Meeting	2021–2022
Workshop Organizer, Undergraduate Soft Robotics Research Workshop, IEEE Robosoft	2021
Workshop Co-organizer, Undergraduate Soft Robotics Research Workshop, IEEE Robosoft	2020

## TECHNICAL PROGRAM COMMITTEE SERVICE

Technical Program Committee Member, Hilton Head Solid-State Sensors, Actuators, and Microsystems Workshop	2020, 2022
Technical Program Committee Member, Transducers Conference	2021

## OTHER CONFERENCE SERVICE

Reviewer, IEEE Sensors Conference	2019
Ad-hoc reviewer, IEEE RoboSoft Conference	2019
Ad-hoc reviewer, IEEE Sensors Conference	2018

## OTHER JOURNAL REVIEW SERVICE

Ad-hoc reviewer, *Science Robotics*  
Ad-hoc reviewer, *IEEE Sensors Journal*

#### PANEL AND GRANT PROPOSAL REVIEW SERVICE

Panel reviewer, National Science Foundation and National Institute of Health, Multiple directorates	2021
Panel reviewer, National Science Foundation EGR directorate (program A)	2018
Panel reviewer, National Science Foundation EGR directorate (program B)	2018
Ad-hoc reviewer, National Science Foundation, Mathematical and Physical Sciences directorate	2017
Panel reviewer, National Science Foundation EGR directorate (program A)	2016

#### PROFESSIONAL MEMBERSHIPS

Senior Member, IEEE  
Member, National Society of Black Engineers  
Member, Materials Research Society

#### INDUSTRY EXPERIENCE

Graduate Intern Technical, Intel Corporation, Hillsboro, OR	2012
Engineering Intern, Lexmark, Inc., Lexington, KY	2007

#### TEACHING RECORD

EGR 390: Introduction to Mechatronics, Smith College	I21
EGR 324: Fundamentals of Microelectronics, Smith College	F20, F17
EGR 323: Introduction to MEMS, Smith College	F19, F16, S16
EGR 220/220L: Electric Circuit Theory and Lab, Smith College	S21, S20, S19, S18, S17, F15
EGR 100: Engineering for Everyone: Bits, ‘Bots, and Thoughts, Smith College	F19, F17, S16

#### TEACHING PEDAGOGY TALKS AND PANEL SERVICE

Panelist, “Inclusion and Equity in Group Work,” Teaching Arts Lecture, Smith College [invited]	2021
Guest lecturer, “A Potential Future for Robotics,” Technophilia/Technoskepticism, Kahn Liberal Arts Institute, Smith College [invited]	2021
Panelist, “Identity in Academia,” Inclusion in Action: Day of Learning, Smith College [invited]	2019
Panelist, “Effective Grading Practices,” Teaching Arts Lecture, Smith College [invited]	2018
Host, “Mentoring undergrad research projects,” Teaching Circle, Smith College	2017

## UNDERGRADUATE THESIS COMMITTEE SERVICE

Total: 9 students<sup>1</sup> advisor  
<sup>2</sup> reader

Honors Thesis (4 credits): Halle Brown<sup>2</sup>, Hayley Markos<sup>1</sup>, Yuhan Wen<sup>1</sup>, Sara Kacmoli<sup>1</sup>, Sara Loric<sup>2</sup>, Xi Jiang<sup>2</sup>

Honors Thesis Extension (1 credit): Meng Cao<sup>2</sup>, Becky Shen<sup>2</sup>

Senior Thesis: Alysha de Silva<sup>1</sup>

## UNDERGRADUATE RESEARCH SUPERVISED

Total: 19 students  
<sup>a</sup> indep study  
<sup>b</sup> summer  
<sup>c</sup> other

Wasila Yussif<sup>a</sup>, Kirsten Appell<sup>a</sup>, Theo Tefera<sup>a</sup>, Malaika Kironde<sup>a</sup>, Piper MacDonald<sup>a</sup>, Molly Loughney<sup>a</sup>, Nana Ansah<sup>a</sup>, Rachael Shannon<sup>a</sup>, Linnea Finkle<sup>a</sup>, Mealakthey Sok<sup>a</sup> 2020–2021

Wasila Yussif<sup>a,b</sup>, Yuhan Wen<sup>b</sup>, Jody Huang<sup>c</sup> 2019–2020

Meng Cao<sup>a,b</sup>, Mariel Jones<sup>a</sup>, Becky Shen<sup>a</sup>, Yuhan Wen<sup>a,b</sup> 2018–2019

Eli Boahen<sup>a,b</sup>, Meng Cao<sup>a,b</sup>, Jody Huang<sup>a</sup>, Dan Lin<sup>a</sup>, Jiaao Lu<sup>a</sup>, Becky Shen<sup>a,b</sup>, Yuhan Wen<sup>a</sup> 2017–2018

Sara Kacmoli<sup>a</sup>, Dan Lin<sup>a</sup>, Jiaao Lu<sup>a</sup> 2016–2017

Dan Lin<sup>a</sup> 2015–2016

## PRESENTATIONS BY STUDENTS

Meng Cao, “Digital signal processing with FPGAs,” Honors Thesis Extension Poster Session, Smith College, 2019

Alysha da Silva, “Mechanical and Electrical Response to Fabricated Uniaxial Polymer,” Celebrating Collaborations Poster Session, Smith College, 2018

Yuhan Wen and Dan Lin, “Fabrication and Testing of Liquid Metal Switches,” Celebrating Collaborations Poster Session, Smith College, 2018

Sara Kacmoli, “Novel intrinsic quantum designs for quantum cascade superluminescent emitters,” Honors thesis presentation, Smith College, 2017

Dan Lin, “A testbed for detecting and mimicking finger joint bending,” IEEE MIT Undergraduate Research Technology Conference, MIT, 2016

## COLLEGE-LEVEL SERVICE

Chair, McKinley Fellowship selection committee Smith College 2020–2021

Committee member, McKinley Fellowship selection committee, Smith College 2019–2021

Organizer “Applying to Grad school” workshop, Smith College 2016

## DEPARTMENT-LEVEL SERVICE

Committee member, Assessments and Standards sub-committee, Picker Engineering Program, Smith College 2019–2021

Committee member, Equity, Diversity, and Inclusion sub-committee, Picker Engineering Program, Smith College 2019–2021



Faculty coordinator for the Fundamentals of Engineering Exam, Picker Engineering Program, Smith College	2017–2020
Committee member Honors and Awards Sub-committee, Picker Engineering Program, Smith College	2017–2019
Committee member, Program Assistant Search Committee, Picker Engineering Program, Smith College	2017
Organizer, “Applying for an engineering summer undergraduate research fellowship” workshop, Picker Engineering Program, Smith College	2017
Committee member, Brodsky Fund for Engineering Entrepreneurship Committee, Picker Engineering Program, Smith College	2016–2017
Co-organizer, Diversity and Inclusion Charrette, Picker Engineering Program, Smith College	2016

#### MEDIA APPEARANCES AND PODCASTS

Interviewee, “Soft, Squishy Robots Could Save Lives,” Axios <a href="https://www.axios.com/soft-robotics-engineering-save-lives-cecad1c2-860a-466b-be9d-573020831641.html">https://www.axios.com/soft-robotics-engineering-save-lives-cecad1c2-860a-466b-be9d-573020831641.html</a>	2021
Guest, IEEE Robotics and Automation Society (RAS) Soft Robotics Podcast, <a href="https://soundcloud.com/ieeeras-softrobotics/kris-episode">https://soundcloud.com/ieeeras-softrobotics/kris-episode</a>	2020
Guest, “Tiny Sensor Problems,” Embedded.FM Podcast, <a href="https://embedded.fm/episodes/214">https://embedded.fm/episodes/214</a>	2015

#### GENERAL AUDIENCE AND OUTREACH TALKS

“Where the rubber meets the code,” Nerd Nite, Northampton, MA	2019
“What’s hard about soft sensors?” SciTech Café, Northampton, MA	2018
“Tactile sensors on people and robots,” Smith College Summer Science and Engineering Program, Northampton, MA	2017
“Skin-worn sensors: Why can’t I buy one yet?,” Celebration of American Science and Engineering, University of Maryland, College Park, MD	2017
“What is Engineering for Everyone?,” Smith College Alumnae Club of Pittsburgh, Pittsburgh, PA	2017

#### BROADENING PARTICIPATION ACTIVITIES

Virtual classroom demo to present origami metamaterials, Brattleboro Area Middle School, Brattleboro, VT	2020
Half-day workshops for MA STEM teachers, Smith College	2016, 2017, 2017, 2020
SCS Noonan Scholars lab tour	2018
Organizer, Soft robotics day for Springfield Urban League STEM youth group, Smith College	2018
Organizer, Motor design workshop for Smith Voc. High School, Smith College	2017
Career Day Participant, Glenwood Elementary School, Springfield MA	2017