Eric V. Eason

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Summary: **Creative problem-solver with engineering skills and fabrication experience.**

Education

Ph.D.	**Stanford University**, Applied Physics	April 2015
B.S.	**University of Colorado, Boulder**, Engineering Physics, summa cum laude	May 2009
B.S.	**University of Colorado, Boulder**, Applied Mathematics, summa cum laude	May 2009

Experience

Biomimetics and Dexterous Manipulation Lab, Stanford Mechanical Engineering — Stanford, CA
Ph.D. Research (January 2010–April 2015)
Dissertation: *Analysis and Measurement of Stress Distributions in Gecko Toes and Synthetic Adhesives*
Advisor: *Dr. Mark Cutkosky (cutkosky@stanford.edu), Department of Mechanical Engineering*

- Developed a numerical model to predict adhesive performance of polymer microstructures.
- Built a computer vision system to measure micro-deformation of gecko-inspired adhesives.
- Built a custom force sensor to measure adhesive stress distributions within a gecko's toe.
- Developed a novel micromachining process to manufacture gecko-inspired adhesives.
- Collaborated with researchers at Stanford, NASA/JPL, and Draper Laboratory to develop practical applications of gecko-inspired adhesives, including a gripper to be used by a spacecraft to capture orbital debris and a system enabling a human to climb a smooth surface.

University of Colorado Physics Department — Boulder, CO
Honors Thesis Research (January 2008–May 2009)
Advisor: *Dr. Kyle P. McElroy (kyle.mcelroy@colorado.edu)*

- Developed instrumentation to investigate the electronic properties and thermodynamic phase structure of high-temperature superconductors with a scanning tunneling microscope (STM).

National Institute of Standards and Technology (NIST) — Boulder, CO
Summer Undergraduate Research Fellowship (May–August 2007)
Supervisor: *Dr. James Bergquist (james.bergquist@boulder.nist.gov)*

- Measured the time rate of change of α, a fundamental physical constant, using an atomic clock.
- Built laser frequency-doubling cavities using nonlinear optics and piezoelectric mirrors.

Technical Skills

Engineering Design

- 10 years experience with SolidWorks. Designed 3D models for rapid prototyping, created moving assemblies, and produced engineering drawings to be sent to machine shops.
- Designed and built custom sensors, manufacturing fixtures, and adhesive testing systems.
- BLINKY.SHOES (2015): Designed and built LED strips with accelerometers, which attach to shoes and light up in response to steps. Designed PCB layout, prototyped hardware & software, and worked with overseas manufacturers. Raised $22,087 on Kickstarter (442% of funding goal).

Prototyping and Fabrication

- Proficient with CNC & conventional machining, laser cutting, 3D printing, and polymer casting.
- Computer-Aided Product Creation course (2011, Stanford University): Used CAD, CAM, and CNC milling to create a stainless steel bottle opener and a set of noncircular aluminum gears.

Technical Skills (Continued)

Laboratory Tools and Computation

- Familiar with vacuum systems, cryogenics, laser optics, and microscopy (STM, SEM, AFM).
- Proficient with digital and analog circuitry and microcontrollers.
- Proficient with MATLAB, Mathematica, LaTeX, Java, C/C++, and EAGLE.

Selected Publications

- E. V. Eason, "Analysis and Measurement of Stress Distributions in Gecko Toes and Synthetic Adhesives," Ph.D. thesis, Stanford University (April 2015).
- E. V. Eason *et al.*, "Stress Distribution and Contact Area Measurements of a Gecko Toe Using a High-Resolution Tactile Sensor," *Bioinspir. Biomim.* **10**, 016013 (February 2015).
- E. W. Hawkes, E. V. Eason, D. L. Christensen, and M. R. Cutkosky, "Human Climbing with Efficiently Scaled Gecko-Inspired Dry Adhesives," *J. R. Soc. Interface* **12**, 20140675 (January 2015).
- E. W. Hawkes *et al.*, "Dynamic Surface Grasping with Directional Adhesion," *IEEE/RSJ Int. Conf. Intelligent Robots and Systems (IROS 2013)*, Tokyo, Japan, pp. 5487–5493 (November 2013).
- E. W. Hawkes, E. V. Eason, A. T. Asbeck, and M. R. Cutkosky, "The Gecko's Toe: Scaling Directional Adhesives for Climbing Applications," *IEEE/ASME Trans. Mechatron.* **18**, 518–526 (April 2013).
- P. Day, E. V. Eason, N. Esparza, D. Christensen, and M. Cutkosky, "Micro-Wedge Machining for the Manufacture of Directional Dry Adhesives," *ASME J. Micro Nano-Manuf.* **1**, 011001 (March 2013).

Presentations

- "Z-Man Quarterly Program Review: Stanford Biomimetics and Dexterous Manipulation Laboratory," DARPA Z-Man Quarterly Program Review, Raleigh, NC (April 2012): presented to a broad audience including private industry (Draper Laboratory), government (DARPA DSO), and military personnel.

Inventions

- E. W. Hawkes, D. L. Christensen, E. V. Eason, and M. R. Cutkosky, "Climbing Device with Dry Adhesives," U.S. Provisional Patent Application No. 61/984,946 (filed April 2014).
- M. R. Cutkosky, P. S. Day, and E. V. Eason, "Synthetic Dry Adhesives," U.S. Patent Application No. 13/451,713 (filed April 2012).

Fellowships and Awards

- Hertz Foundation Graduate Fellowship (2009–2014): awarded to only 15 science and engineering Ph.D. students in the U.S. per year.
- NSF Graduate Research Fellowship (2009–2014).
- Stanford Graduate Fellowship (2009–2014).
- Tau Beta Pi Centennial Fellowship (2009–2010).
- University of Colorado Outstanding Graduate for Academic Achievement, College of Engineering (May 2009): Awarded for highest GPA in the College's graduating class (GPA 3.994).
- Sigma Xi Undergraduate Research Award, CU Chapter (2009).

Other Interests:

Robotics (Arduino/LEGO); classical piano (19 years practice); electronic music composition, arranging, and production; skiing; bicycling.

Affiliations and Honor Societies:

ASME, MRS, Tau Beta Pi, Sigma Xi.