LINA AVANCINI COLUCCI

www.linacolucci.com • 781-956-7889 • colucci.lina@gmail.com

EDUCATION

Massachusetts Institute of Technology, Harvard-MIT Health Sciences and Technology (HST) Program — Cambridge, MA
PhD, Medical Engineering and Medical Physics — June 2018
Thesis: Quantifying fluid overload with portable magnetic resonance sensors

- GPA 5.0/5.0, NSF GRFP fellow (14% acceptance), Hertz Graduate Student Fellowship finalist (6% of applicants), MIT ODGE and MEMP fellow
- Engineering coursework at MIT. 1st-year medical classes and clinical rotations at Harvard Med. School
- Relevant Coursework: Analysis of Electronic Health Records, Advanced Instrumentation and Measurement, Feedback Control Systems, Magnetic Resonance, Data Acquisition and Image Reconstruction in MRI, Human Pathology, Cardiovascular Pathophysiology, Respiratory Pathophys., Renal Pathophys., Entrepreneurship in Engineering, Introduction to Clinical Medicine (3-mo hospital rotations)

Duke University, Pratt School of Engineering — Durham, NC
BSE, Mechanical Engineering — May 2012

- GPA: 3.7/4.0, Graduation with Distinction in Mechanical Engineering, Dean's List with Distinction
- Robertson Scholar: Full-ride, 4-year merit scholarship including dual enrollment at both Duke and UNC Chapel Hill. Offered to ~30 students every year from over 60,000 applications
- Exchange student for 6 months at Royal Institute of Technology (KTH), Stockholm, Sweden
- Relevant Coursework: Computational Methods in Engineering, Mechanical Analysis for Design, Engineering Innovation, Dynamics, Mechatronics, Control Systems, Fluid Mechanics, Heat & Mass Transfer, Mechanical Design

RESEARCH

Cima Lab, Koch Institute, MIT — Cambridge, MA
PhD Student — June 2013 – Present
Developed the algorithms and performed clinical validation on a novel, portable sensor to track fluid status using magnetic resonance.

- Wrote Matlab and R analysis code and developed algorithms to analyze custom sensor, MRI imaging, bioimpedance, and EHR data. Github repository: www.github.com/lcolucci/MRI
- Developed study protocols and wrote applications approved by hospital IRB
- Collected multi-modal sensor and MRI imaging data on patients at Mass. General Hospital (MGH)
- Led team of 5+ nephrologists, engineers, and physicists
- Mentored 2 undergraduate student researchers and 1 summer high school student

Advisor: Dr. Michael J. Cima, David H. Koch Professor of Engineering, MIT

Orthopaedic Bioengineering Laboratory, Duke University — Durham, NC
Undergraduate Researcher — Aug 2011 – May 2012
Studied scaffolds that are best suited for cartilage tissue engineering. Analyzed the effects of freeze rate and cartilage concentration on scaffold pore size, mechanical properties, and cell infiltration.
Advisor: Dr. Farshid Guilak, Director of OBL and Editor of Journal of Biomechanics, Duke University

Janalakshmi Financial Services — Bangalore, India
Researcher and Project Manager — May – Aug 2010
Studied effects of internal migration on poverty in urban slums in Bangalore, India. Directly supervised 30-person team to conduct 1500 interviews over 2 months. Founding team of a 5+ year research effort.
Advisor: Dr. Anirudh Krishna, Public Policy Professor, Duke University

WORK EXPERIENCE

MIT Hacking Medicine — Cambridge, MA
Co-Director & Member — Aug 2013 - Present

The mission MIT Hacking Medicine is to ignite healthcare innovation around the world by bringing together doctors, engineers, designers, and business people to tackle real healthcare problems.
During my year as Co-Director (2014-2015):

- Recruited and **led a 18-person team**
- Organized **15 health hackathons** in across 5 states and 5 countries (USA, Qatar, Uganda, Spain, and India)
- Conducted two interactive panel sessions at **SXSW** 2015 (Austin, TX)
- Organized Grand Hack **event with 450 participants** from 19 states & 8 countries, one of largest in world
- Raised over **$120,000** not including hackathon costs paid directly by partners
- **Partners:** Clinton Foundation, GE, Samsung, athenahealth, Joslin Diabetes Center, MGH, and more
- Gave a **TEDxBrussels** talk (Dec 2014) to tell the world about our mission: https://youtu.be/8-wo5YnYr-g

NIKE, Inc. — Beaverton, OR
Product Creation Intern — Jun – Aug 2011

Conducted **biomechanics** research using force plates, high-speed video and motion capture to improve the understanding of gender differences in landing (Nike Sports Research Lab and Innovation Kitchen).
Advisors: Dr. Matthew Nurse, Director of Nike NSRL. Tobie Hatfield, Director of Nike Innovation Kitchen.

Colucci DANZA: Innovative Pointe Shoes — Durham, NC
Inventor — Boston, MA
2006 – 2012

Redesigned the traditional ballet pointe shoe for safety, comfort, and improved ergonomics.

- First Author and Cover Story / "Development of an Innovative Ballet Pointe Shoe" (EiD, 2008)
- 1st place / Massachusetts State Science Fair 2006 – MIT
- Best Presenter / Selected by Aaron Patzer, founder of Mint.com, at Duke Start-up Challenge 2010

Advisor: Dr. Devorah Klein, IDEO

Breakthrough Collaborative — New Orleans, LA
Science Teacher — Jun – Aug 2009

Taught 40 high-potential middle school students from low-income areas of New Orleans. Lesson-planned and developed curriculum for classes in Science, Engineering, and Dance (extra-curricular).

Clarinet Teacher (Self-Employed) — Lexington, MA 2006-2008

Taught weekly lessons to 6 middle school clarinet students for 2 years

PUBLICATIONS AND PATENTS

Colucci, L.A., Corapi, K.M., Li, M., Parada, X.V., Lin, H.Y., Ausiello, D.A., Rosen, M.S., Cima, M.J. Magnetic relaxometry for fluid assessment in end-stage renal disease. *In submission.*

Colucci, L.A. 2018**.** Quantifying Fluid Overload with Portable Magnetic Resonance Sensors. PhD thesis, Massachusetts Institute of Technology, Cambridge, MA.

Colucci, L.A., Li, M., Corapi, K., Allegretti, A., Ahmed, R., Lin, H.Y., Cima, M.J. Development of Relaxometry Methods and Hardware for Routine Determination of Volume Status: Dialysis Pilot Study. *Proc. Intl. Soc. Mag Reson. Med.*, 2016 (24): 2692.

Rowland, C.R., **Colucci, L.A.,** Guilak, F. Fabrication of anatomically-shaped cartilage constructs using decellularized cartilage-derived matrix scaffolds. *J. Biomaterials*. 2016; 91:57-72.

Majmudar M.D., **Colucci L.A.,** Landman A.B. The quantified patient of the future: Opportunities and challenges. *Healthcare*. 2015;3(3):153–156.

Colucci L.A., Li, M., Cima, M.J. Quantification of Fluid Accumulation in IP Space of Mice using Whole-Body NMR. *Proc. Intl. Soc. Mag. Reson. Med.*, 2015 (23): 3262.

Li, M., Vassiliou, C.C., **Colucci, L.A.**, Cima, M.J. ^{1}H nuclear magnetic resonance (NMR) as a tool to measure dehydration in mice. *NMR Biomed*. 2015;28(8):1031–1039.

Cima, M.J., Li, M., **Colucci, L.A.,** Vassiliou, C., Tavassolian, N. NMR sensor and methods for rapid, non-invasive determination of hydration state or vascular volume of a subject. US Patent #: US20160120438A1

Colucci, L.A. The effects of freeze rate and slurry concentration on stiffness of cartilate-derived matrix scaffolds. Senior Thesis, Mechanial Engineering Department, Duke University. Faculty Advisor: Farshid Guilak. PhD Mentor: Chris Rowland. 2012.

Colucci L.A., Klein, D.E. Development of an Innovative Pointe Shoe. *Ergonomics in Design*. 2008;16(3):6–12. *(Cover story)*

TALKS AND PRESENTATIONS

Colucci, L.A. Pine Health. MIT Delta V Demo Day. Cambridge, MA.

- ~1000 live audience members. Video: www.youtube.com/watch?v=GjVRVNh2uk4

Colucci, L.A. Magnetic Resonance Methods for Quantifying Fluid Overload Using Portable MR Sensors. Poster presentation at **HST Forum**. Harvard Medical School, Boston, MA (2017).

- Winner of Medical Devices track

Colucci, L.A. (moderator). Women in Healthcare: Why Boston, Why Now, and What Does the Future Look Like? **Duke Boston Women's Forum.** Loews Hotel, Boston, MA (2016).

- ~100 live audience members. One of the largest events the Duke Alumni Women's group has ever held.

Colucci, L.A., Li, M. Team Poseidon: Novel Non-Invasive Hydration Sensor. **Soldier Design Competition**, MIT, Cambridge, MA (2016).

- 3rd place team. Competition for students at MIT and West Point Academy to build better tools for soldiers.

Colucci, L.A. (panelist). Career Panel for High School Girls. Summer Pathways in Science and Engineering Program, **Boston University**, Boston, MA (2016).

- 25 high school girls interested in exploring science and engineering

Colucci, L.A. Why I Chose Duke. Blue Devil Days Closing Ceremony, **Cameron Indoor Stadium**, Duke, Durham, NC (2016).

- Duke Admissions asked Lina to speak to accepted high school students and their parents visiting Duke
- ~800 live audience members.

Graboyes, R., **Colucci, L.A.,** Martin, C. Policies to Promote Health Care Innovation: A Walk on the Supply Side. 32nd **NABE Economic Policy Conference**. Capital Hilton, Washington, D.C. (2016).

- ~50 in live audience members attending the panel. Video: www.linacolucci.com/2016/04/nabe-panel-policies-to-promote-health-care-innovation/

Colucci, L.A. Why We Should All Hack Medicine. **TEDxBrussels**, Brussels, Belgium (December 2014).

- ~ 2,000 live audience members at Bozar Theatre. Over 5,700 views on YouTube.
  Video: https://youtu.be/8-wo5YnYr-g

Colucci, L.A. Hacking Medicine: Break it down. Build it up. Make it better. **Institute for Health Innovation**, Duke Univ., Durham, NC (2015).

- ~100 live audience members. Inspired Duke students to run their own health hackathon (1st one in NC).
  Video: www.linacolucci.com/2015/02/hacking-medicine-duke-lecture/

FEATURED IN THE NEWS

"Fluid Dynamics: A Young Virtuoso is a Study in Versatility," ASEE Prism, October 2016.
http://www.asee-prism.org/up-close-oct-3/

"How to (seriously) read a scientific paper," Science Careers, 21 March 2016.
http://www.sciencemag.org/careers/2016/03/how-seriously-read-scientific-paper

"En Pointe," Science, Vo. 348, Issue 6232, Page 366 (2015)
http://www.sciencemag.org/careers/2015/04/en-pointe
(Additional shorter version in Science "Working Life" column)

"How do you hack health care?" MIT News. July 2015.
http://news.mit.edu/2015/how-do-you-hack-health-care-use-design-thinking-0720
Slice of MIT Podcast: https://alum.mit.edu/slice/podcast-exploring-mindset-behind-big-ideas

"Hacking Medicine to Fix Healthcare." Real Business, 2015. (two-part video series)
Part 1: https://youtu.be/0c9p3UmZokI
Part 2: https://youtu.be/zJdwwwXqjS4

"Designing Cool Stuff," Distinction: The Scholars Magazine (Fall 2014, Inaugural Issue)
Screenshots: http://www.linacolucci.com/about/designing-cool-stuff/
Full Magazine Issue: https://issuu.com/cholcomb/docs/distinction_110514_final_962bf965a2f6e0

Duke Admissions Homepage: Alumni Feature (2012-2016)
http://admissions.duke.edu/experience/excellence

"The Next Big Thing," DMIX Magazine (Winter 2012)
Screenshots: http://www.linacolucci.com/the-next-big-thing/
Full Magazine Issue: https://issuu.com/46east/docs/dmix_wint2011_plumlee_web

SKILLS

Matlab, Python, R, SolidWorks 3D CAD, SQL, Git, Latex, Adobe Photoshop, Illustrator, InDesign, Lightroom, Wordpress, SquareSpace.

Lived in Brazil (birth place), Canada and USA. Traveled in 22+ countries. Native in Portuguese and English. Fluent in Spanish. Elementary in Swedish. Has danced **ballet and jazz** for the past 20 years. Plays **clarinet and saxophone** in classical and jazz ensembles for 15 years.

Avid photographer and blogger (see **linacolucci.com**).