



RESUME GUIDELINES

A resume is a one-of-a kind professional summary that employers and recruiters use to get a grasp of your experiences, skills, interests, and achievements. If written well, a resume is your ticket for that coveted interview spot. So showcase—don't list. Be succinct—not longwinded. Take your time—don't rush. Those busy recruiters and HR managers will zip through your resume if it doesn't pique their interest. In fact, most prospective employers will spend 10-30 seconds reviewing it. To ensure that yours gets the attention it deserves, we recommend that all Thayer School students use the following guidelines.

BEFORE YOU START

Prepare a list of all your experiences: work and internships, extracurricular activities, academic, research and project based experiences, and your skills and interests. Include the name of the organization, its location, your title, and the dates you were there. For each experience, explain your purpose, your task(s), and the results of your work. Think about your responsibilities. Think about the skills you used and the ones that you gained. Leave no stone unturned—you can delete extraneous details later.

LAYOUT & FORMAT

- Length: Resumes should be one page, unless you are a Ph.D. student or have more than five years of work experience.
- Appearance: Be consistent. Adapt the same formatting approach throughout the entire document so that it looks clean, and is easy to read. Please do not use Microsoft Word templates to create and modify resumes. Since these templates are designed in a table format, they are difficult to modify.
 - Margins: 0.5" – 1"
 - Font: Arial, Garamond, Cambria, and Times New Roman are great choices.
 - Size: 10-12 point is the norm. Your name and section headings can be larger, specifically 14-16.
 - Use Bullet Points or Sentences (paragraph format) to describe key accomplishments and contributions.
 - Abbreviations: only abbreviate states and months. If you write "Hanover, NH" for your first bullet point, do not write: "Hanover, New Hampshire" for the second. Note: Do not abbreviate words (e.g., pres. for president; dept. for department; intl. for international).
 - Paper: unless you are submitting your resume online, it should be printed on resume paper. If you find yourself in a bind, we have some available in our office.

CONTENT

When describing your experiences, always begin phrases with action words (page 4 has a list). The goal here is to grab the reader's attention and present your best skills. Note: Avoid nonspecific terms like "Helped", "Responsible for", and "Duties included". Don't use personal pronouns, and don't forget to use the past tense unless it's a position that you currently hold.

CATEGORIES

Thayer resumes are divided into sections (usually three to five). For example: Education, Experience, Engineering Projects, Leadership & Activities, Skills & Interests.

EDUCATION

- Include your current degree, school, major, relevant coursework, and any other higher education institutions from which you have graduated (list only month and year). Include your thesis if related to the position being sought or to your career of interest. You may include your GPA; our rule of thumb is list if it's 3.0 or above.
- Degrees should be listed in reverse chronological order (current degree first). If you are receiving an A.B. degree, put "Dartmouth College" as your school. For all graduate level degrees (B.E., M.E.M., M.S., and Ph.D.), write: "Thayer School of Engineering at Dartmouth College." With the exception of the Ph.D. degree, all other degrees should be spelled out:

A.B. degree

Dartmouth College, Hanover, NH

June 2018

Bachelor of Arts in Engineering Sciences modified with Biology

B.E. degree

Thayer School of Engineering at Dartmouth College, Hanover, NH

June 2018

Bachelor of Engineering concentrating in Chemical Engineering



M.S. degree

Thayer School of Engineering, Dartmouth College, Hanover, NH
Master of Science in Engineering Sciences

March 2014

M.E.M. degree

Thayer School of Engineering at Dartmouth College, Hanover, NH
Master of Engineering Management (M.E.M.)

November 2015

A collaborative program taught by faculty from the Thayer School of Engineering and the Tuck School of Business.

**If you use the M.E.M. acronym, it should be listed after the degree is spelled out (as shown above).*

Ph.D. degree

Thayer School of Engineering, Dartmouth College, Hanover, NH
Ph.D. in Engineering Sciences

March 2018

Dual degree

Thayer School of Engineering at Dartmouth College, Hanover, NH
Bachelor of Engineering, Concentration: Electrical

June 2018

Colby College, Waterville, ME
Bachelor of Arts in Physics

May 2018

Study Abroad/Summer Education/Transfer

Universidad de Belgrano, Buenos Aires, Argentina

Spring 2016

HONORS & ACCOMPLISHMENTS

List those relevant to your major, and are well known within your field of interest or nationally (i.e., National Honor Society, Phi Beta Kappa). Make an appointment with us so we can help you determine which ones to keep.

EXPERIENCE

Show, don't tell! Avoid flowery adjectives, personal pronouns, and adverbs unless absolutely necessary. Instead, provide concrete examples of your work demonstrating your skills and personal attributes. A well-written resume and cover letter is a manifestation of superior writing skills.

Structuring the experience section of your resume is dependent on a two factors: what you are looking for and what you have done. Regardless of how you decide to organize this section, you should follow these guidelines:

- All experience listings must include the organization name, your position within the organization, the location (city and state), and dates. (Month and year is preferred, although it's suitable to put the seasons and year, or just the years as long as you have sufficient work experience.)
- When describing an experience, be as concise and interesting as possible.
- List what you've done in reverse chronological order, placing your most recent experience first and then working backwards.
- Show quantitative results when you can (e.g., "Increased efficiency by 20%" or "Cut budget by 30% in five months").

ENGINEERING PROJECTS

Thayer prides itself in being innovative, creative, and collaborative. Listing your engineering projects (e.g., Dartmouth Formula Racing Team) is a great way to show employers that you have the hands on skills to be a successful engineer. Describe what you've done on that specific project: your responsibilities, your findings, and the implications of your work. If you've worked under the auspices of a company sponsored project for your coursework (i.e. ENGS89/90, or ENGG390), you can mention the company sponsoring the work, just ask for their permission first.

Include unpaid internships and volunteer work (e.g., extra hours volunteering in the machine shop) along with paid employment. Some ideas for this heading: Project-Based Experience, Academic Experience, Research Experience, and Engineering Experience.



ACTIVITIES

Most resumes contain a secondary section that lists information on your extracurricular activities. The names of this section can vary from Extracurricular Activities to Leadership & Community Service. We can help you determine the appropriate title for this section and what to include.

SKILLS & INTERESTS

Break out skills separately into subcategories: if you have strong computer skills in administrative, creative, and programming applications, create a "Software" category with your knowledge of Microsoft Office, Dreamweaver, InDesign, etc., and a "Programming" category where you list programming languages. "Language" is another popular subcategory. Keep in mind, however, that every item on your resume is a potential question from your interviewer, so be honest about what you know. Language fluency is usually categorized as: elementary proficiency, working proficiency, professional proficiency, or native/bilingual.

Don't Include:

- Personal information: resume writing conventions vary by country and by culture. In the U.S., it is illegal for employers to ask about your race, religion, national orientation, age, marital status, or other personal information. NEVER list your Social Security number on your resume.
- Citizenship status. Generally, employers only need to know if you are legal to work in the United States, not whether you're a citizen or permanent resident. If citizenship status is critical to making a hiring decision, an employer will ask. In all cases, students should respect the qualifications requested by employers, and only apply for those positions for which they are appropriately qualified. (Note: In some cases, students may wish to volunteer information about citizenship, particularly if the information is in the student's favor. If you have questions, please contact Career Services for more information.)
- References. Do not include a reference list with your resume unless requested by the employer. Guidelines for creating a list of references are available through our website.

REMEMBER

Your resume is a document that you have complete control of. Make it perfect, because you can. Take into account all the feedback you have received, embrace the red pen marks, and distill it all down to something that feels right to you.

NEED ADDITIONAL HELP?

Schedule an appointment with Thayer School Career Services by stopping by Cummings 135, calling 603-646-0630, or emailing Engineering.Career.Services@Dartmouth.edu. We can help you with all phases of the process, from figuring out how to write your first resume, to proofreading your final copy.



ACTION VERBS TO GET YOU STARTED

View more at: www.writeexpress.com/action-verbs.html

accomplished	controlled	forecasted	modified	researched
achieved	coordinated	formulated	negotiated	selected
administered	created	generated	operated	spearheaded
analyzed	delegated	identified	organized	streamlined
applied	designed	illustrated	overhauled	supervised
assembled	determined	implemented	oversaw	surveyed
assessed	developed	improved	presented	synthesized
budgeted	devised	initiated	processed	targeted
calculated	directed	inspected	produced	trained
clarified	edited	instructed	programmed	troubleshoot
collaborated	established	interpreted	projected	updated
compiled	estimated	invented	promoted	verified
conducted	evaluated	investigated	quantified	
consolidated	expanded	maintained	recommended	
constructed	expedited	measured	reduced	
contracted	facilitated	modelled	reorganized	

Do you have one of these FAQ's? Come talk to us!

- Should I include high school information?
- Should I include TA experience?
- Should I include interests? If yes, how many and how specific?
- Objective vs. Summary: which one is right for me? Should I include one at all?
- I will be taking a class next term that relates to my career interests. Should I include it?
- What is the best way to email a resume?
- LinkedIn: should I include a link to my profile in my header

ADRIEN MOREAU

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EDUCATION

- Dartmouth College**
Hanover, NH
June 2016
- Bachelor of Arts in Biomedical Engineering modified with Public Policy
 - Major GPA: 3.43/4.00
 - Relevant coursework: Systems, Differential Equations, Genetics, Biochemical Engineering and Biotechnology, Philosophy of Law, Economics of Policymaking
 - Computer skills: MATLAB, C Programming, SolidWorks, Excel, R, Stata, Photoshop
- Needham High School**
Needham, MA
June 2012
- Relevant coursework: Physics, French, US Government, Physiology, Studio Art
 - Awards: Boston Scholastic Art Awards Portfolio Gold Key, RIT Innovation & Creativity Award, Tuttle Memorial Pallavi Vocal Competition - 2nd Place

RELEVANT EXPERIENCE

- Thayer School of Engineering**
Hanover, NH
Research Scholar
March 2014-present
- Collaborate with biotechnology Professor on multimodal brain imaging device using magnetic nanoparticles
 - Create MATLAB simulation of proposed device, and write technical report outlining construction and results of MATLAB simulation
 - Help write grant proposals to NSF and other agencies for funding of project
- Thayer School of Engineering**
Hanover, NH
Teaching Assistant
March-June 2014
- Assisted with project-based design course: Introduction to Engineering
 - Guided a group of students through the design process, writing technical reports, giving effective presentations, and building final prototype of designed device
 - Met regularly with group to manage short and long term goals for the project; mediated issues relating to group dynamic
- Northeastern Young Scholars Program**
Northeastern University
Boston, MA
Research Scholar
June-August 2011
- Created 3-Dimensional models of standard single point and quad point canes using SolidWorks and analyzed models using finite element analysis
 - Explored the areas of stress in the knee due to loading with Abaqus
 - Interpreted data in the context of knee osteoarthritis
 - Designed and presented research poster and PowerPoint in Young Scholar research exhibition
 - Research sponsored by the National Science Foundation

ADDITIONAL EXPERIENCE

- Thayer School of Engineering**
Hanover, NH
Tour Guide
June 2014-present
- Lead tours for prospective Thayer School students and families
 - Present different facets of the Thayer School curriculum and facilities to encourage application to Dartmouth College
- Hanover Singers**
Hanover, NH
South Indian Classical Singing Instructor
January 2013-present
- Instruct 5-year-old girl in South Indian classical (Carnatic) music
 - Develop lesson plan for each class
 - Foster nurturing learning atmosphere in lessons

LEADERSHIP & ACTIVITIES

- Dartmouth Decibelles A Cappella Group**
Hanover, NH
Business Manager
September 2012-present
- Communicate with venues to coordinate shows and raise funds
 - Serve as treasurer of the group; draft and handle the budget
 - Work with other executive officers to make decisions relating to group dynamic, funds, and other issues that arise

Aadhya Goyal
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EDUCATION

- June 2016 **THAYER SCHOOL OF ENGINEERING, DARTMOUTH COLLEGE** Hanover, NH
Bachelor of Engineering concentrating in Mechanical Engineering, GPA: 3.7/4.0
 - Awarded a citation for academic excellence in Environmental Engineering
- June 2015 **Bachelor of Arts in Engineering Sciences and Psychology, GPA: 3.59/4.0**
- Summer 2014 **TUCK SCHOOL OF BUSINESS AT DARTMOUTH** Hanover, NH
Tuck Business Bridge Program
 - Attended highly selective business program; completed team-oriented valuation project of Wynn Resorts that included a financial and strategic assessment, a DCF analysis, and a final presentation to a panel of investors and MBA professors.

WORK EXPERIENCE

- Summer 2015 **MACLEAN-FOGG** Pocahontas, AR
Manufacturing Engineer, ESNA Division
 - Designed, prototyped, machined, and implemented an aerospace nut testing machine for \$20,000—half the price of outsourcing it annually, and 10% of the quoted cost to build
 - Filmed, directed, and produced a James Bond themed marketing video, starring our General Manager, which highlighted the year's improvements for a corporation wide competition; the video won first place
- Summer 2014 **THAYER SCHOOL OF ENGINEERING** Hanover, NH
Independent Researcher, Sponsored by Professor Vicki May
 - Invented proprietary technology to split, core, and bind bamboo for sustainable construction
 - Designed house for Haiti relief using bound bamboo to reduce costs by 80% compared to concrete
 - Created informational video using iMovie to market and publicize product
- Winter 2013 **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** Cambridge, MA
Research Intern, Francis Bitter Magnet Lab
 - Developed program to convert NMR data of the M2 protein into a 3D model of its helical structure
 - Initiated efficiency improvement on data processing procedure by writing program in self-taught Python language to automate manual data transfer and analysis
 - Doubled yield of purified protein by reducing losses and combining steps through reorganizing lab layout

PROJECT EXPERIENCE

- Spring 2015 **COMPUTER-AIDED MECHANICAL ENGINEERING DESIGN** Hanover, NH
 - Designed, machined, and fabricated a diwheel that won a four lap course competition to complete four laps on a course
 - 3D modeled, machined using CAM, and produced an injection molded finger spork for camping
 - Designed, machined using CAM, and welded a wine bottle holder with bottle opener functionality
- Winter 2015 **PRODUCT DESIGN** Hanover, NH
 - Prototyped and machined a vacuum-blower box to clean boots as people walk through entryways
 - Developed an organizer application that integrates with users' syllabus and sends alerts to start tasks
 - Designed, prototyped, and 3D modeled a portable PA speaker system with superior bass response in a small footprint
- Fall 2014 **MACHINE ENGINEERING** Hanover, NH
 - Designed, machined, and constructed a robot that picks up balls and places them in tubes
 - Won class competition to collect most balls in limited time; earned a meritorious performance award

SKILLS AND INTERESTS

Machining Skills: 3 axis milling, 2 axis lathing, CAM, laser cutting, 3D printing, injection molding, welding, plasma cutting
Computer Skills: SolidWorks CSWA certified, SolidWorks composer, C++, MATLAB, Photoshop, iMovie, PowerPoint
Language Skills: Bilingual Spanish, Elementary Proficiency Italian

KARIN TANAKO

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EDUCATION

Dartmouth College Thayer School of Engineering, Hanover, NH **Dec 2016**

Masters of Science in Materials Science

Bachelors in Engineering in Computer Engineering **June 2016**

Colgate College, Hamilton, NY **May 2014**

Bachelor of Arts, Chemistry Major, Math minor; Dual-Degree Engineering Program

LEADERSHIP AND WORK EXPERIENCE

Google, New York, NY **Fall 2015**

Business Intern

- Developed scalable innovative technical solutions serving the AdWords customer base
- Increased Google Ads sales by over 30% through outreach to existing Google customers

OpenWater Power (Greentown Labs Incubator), Boston, MA **Summer 2015**

Electrochemistry Engineer

- Optimized fuel cell performance using electroanalytics; integrated technology with Underwater Unmanned Vehicles
- Electrochemically characterized experimental fuel cell materials for an Aluminum-Seawater reactor
- Presented bi-weekly tech update to key investors: Shell's Venture Branch & Naval Engineering R&D Office

NSF Polar Ice Core Collection and Transport Project, Barrow, AK **Spring 2014-Spring 2015**

Project Engineer

- Multi-year interdisciplinary project to design specialized ice core transport device for Polar Researchers
- Device used in 2015 NSF Arctic field studies to collect and transport 25 ice cores from the Arctic Ocean

Dartmouth Institute of Security, Technology, and Society, Hanover, NH **Fall 2013-Present**

Ethical Hacker Club Leader

- Organizing 6 hour/week cybersecurity reading group & hands-on penetration testing sessions with 15 active members
- Building excitement & inclusive cross-discipline awareness about innovations to handle cybersecurity vulnerabilities

American Medical Systems, Hanover, NH **Spring 2013**

Industry Consulting Project Engineer

- Developed novel implantable medical device to restore continence to men post-prostatectomy

Nestlé Nespresso S.A., Jardín, Colombia **Summer 2012**

Consultant for Ecolaboration AAA Sustainability Program

- Inspected local facilities to learn about coffee-processing, quality control, and environmental safeguards
- Suggested bioremediation and environmental coffee-processing improvements to CafeCultura Program
- Organized educational sustainability outreach program with local schools

ACHIEVEMENTS

NSF 2015 Graduate Research Fellowship Honorable Mention | (*National Science Foundation*)

Russian Student Ambassador Washington D.C. Summit | (*International Association of Russian Culture & Language*)

Provisional Patent | *Temperature Gradient Storage System & Method* | (*Inventor; U.S. Patent No 0000000*)

Stefansson Fellowship | Executed transfer of Arctic fieldwork electronics worth \$150,000 | (*Institute of Arctic Studies*)

Morehead Scholarship Finalist | (*UNC-Chapel Hill*)

SKILLS & INTERESTS

Languages: MySQL, UNIX, Git, C (beginner/moderate), Assembly, Matlab, Russian (native speaker & Dual Citizenship)

Interests: Cybersecurity, colonizing Mars, dinosaur paleontology, rock & ice climbing

HAZEL HOLBROOK

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EDUCATION

Dartmouth College, Thayer School of Engineering, Hanover, NH September 2012 – December 2016

Doctor of Philosophy, Engineering Sciences

- Teaching Assistant for 5 undergraduate and 2 graduate level courses ranging from statistics to image processing
- Dartmouth Center for the Advancement of Learning, Graduate Rep for 1.5 years to facilitate interdisciplinary dialogue

Colorado School of Mines, Golden, CO August 2008 – May 2012

Bachelor of Arts, Physics; Minor, Economics; Magna Cum Laude; GPA: 3.82/4.00

- Merit Based Full Scholarship
- Algernon Sydney Sullivan Medallion, highest nonacademic recognition awarded to a student with exemplary character

RESEARCH

Clinical Applications of Biotech Laboratory, *Researcher*, Dartmouth College, Hanover, NH May 2014 – Present

- Developing bioimpedance sensor and electrical impedance tomography system to intraoperatively access testicular cancer margins to assist surgeons; clinical testing projected within 2017
- Developing data analytics and visualization tool to explore analyzing ex vivo data with machine learning algorithms

Physics Department, *Undergraduate Researcher*, Colorado School of Mines, Golden, CO May 2009- May 2012

- Researched over the course of 3 years on topics including astronomy and acoustical imaging using speckle subtraction techniques

ENTREPRENEURIAL EXPERIENCE

Health Advocacy Innovations (HAI), *Engineering Consultant*, Dartmouth College, Hanover, NH April 2015 – Present

- Collaborate with founders of HAI and 4 engineers to design a pediatric drug dispenser for tuberculosis; patent applied

Ideas Generation Pitch, *Finalist*, Tuck School of Business, Hanover, NH November 2015

- Recognized as top 10 out of 200+ ideas to better college application process using a matching algorithm

Barris Incubator Pitch Competition, *Finalist*, Tuck School of Business, Hanover, NH September 2013

- Selected for incubation and awarded \$5,000 monetary support in addition to legal and management advice on developing a startup

Making Lives Better, *Founding President*, Colorado School of Mines, Golden, CO September 2009 – May 2012

- Headed fund-raising activities for the club, raised almost \$100,000 in four years
- Oversaw three health camps in Delhi, India during which 4,000+ people received health checkups and free medicine
- Organized and co-led educational outreach program at Bal Mandir Primary School, Delhi ranging from toilet construction, classroom renovation, stationaries, water purifiers, and uniforms for 173 students

LEADERSHIP

Dartmouth for Haiti, *Student Leader*, Dartmouth College, Hanover, NH March 2014 – Present

- Develop an earthquake detection sensor with aim to commercially produce the devices in Port Au Prince by April 2017
- Coordinate awareness and fundraising based community wide events in response to 2010 Haiti earthquake
- Manage financials and liaison between the club and partner NGO Port Au Prince; raised over \$10,000

WORK EXPERIENCE

Office of Residential Life, Colorado School of Mines, *House Manager*, Golden, CO February 2011 – May 2012

- Counseled 17 residents on personal, academic, and career concerns as well as planned and executed monthly events

Waste Watch, *Intern*, London, England September 2010 – December 2010

- Researched various auditing techniques to facilitate sustainable practices in schools and re-organized past databases
- Conducted energy audits in Graveney Secondary School in the areas of energy, water, waste, travel, and food

PUBLICATIONS

[Full list on LinkedIn under Google Scholar link]

Clinical Applications of Biotech Laboratory, *Researcher*, Dartmouth College, Hanover, NH September 2012 – Present

- **Journals:** Authored journal article published July 2015; co-authored journal article published May 2015 in *Nature*
- **Conferences:** 10 published papers in peer-reviewed conferences, including 4 presentations to 100+ audiences

ACADEMIC PROFILE**Thayer School of Engineering at Dartmouth College**, Hanover, NH November 2016*Master of Engineering Management (M.E.M.) Candidate*A collaborative program taught by faculty from the **Thayer School of Engineering** and the **Tuck School of Business**.*Courses:* Internet Business Strategy, Marketing, Entrepreneurship, Leadership, Finance, and Mobile Programming**UCLA (University of California, Los Angeles)**, Los Angeles, CA June 2013*Bachelor of Science in Computer Science & Engineering '13; Dean's Honor List; GPA: 3.57/4.00***International Baccalaureate Diploma**, Fullerton, CA June 2007

EXPERIENCE**TripAdvisor LLC** *Product Manager Intern*, Newton, MA June 2015 – August 2015

- Produced a 35% increase in conversion by decreasing consumer conversion time on Trip Advisor's Vacation Rental feature.
- Analyzed, investigated, and proposed solutions for keywords not currently being optimized by SEO keyword search and analysis.
- Collaborated with UX designers, engineers, and data analysts to take 6 new features through the development lifecycle from conception to completion within a 3-month period.

LinkedIn Corporation *Project Manager Intern*, Mountain View, CA June 2014 – August 2014

- Reduced costs by \$80,000 by completing Phase 1 of a multi-quarter long project one month ahead of schedule.
- Negotiated and persuaded project stakeholders to commit resources for a multi-quarter long project.
- Developed communication templates utilized by all Production Operation Program Managers across LinkedIn that facilitated standardization and efficient communication of project details to stakeholders.

Cisco Systems, Inc. *Technical Intern*, Milpitas, CA June 2012 – September 2012

- Examined the ROI of integrating new tools into the engineering quality team through analyzing the stakeholder requirements, business impact, resources, headcount, roadmap, and risks.

UCLA Research on Energy Efficient Algorithms *Researcher Assistant*, Los Angeles, CA January 2011 – January 2012

- Analyzed and tested data output from newly created matching algorithm to determine reduction of energy consumption.

PREVIOUS PROJECTS**Facebook's Profitability Strategy** *Tuck Strategy Principles for Internet Businesses*, Hanover, NH March 2015

- Analyzed Facebook's strategy and ability to achieve a reasonable level of profitability.

Trezher *Co-Founder*, Hanover, NH November 2014 – June 2015

- Assessed the initial product concept with those working in marketing and finance for a travel scheduling website.
- Investigated and validated user value propositions, target markets, competition, and operational and revenue strategies.

Sixdegrees *LinkedIn Intern Hackday 2012*, Mountain View, CA August 2013

- Developed UI (Java) and product concept of an Android application, which allowed users to request third degree contacts.

LEADERSHIP**Master of Engineering Management Council** *VP of Professional Development*, Hanover, NH September 2014 – Present

- Lead the MEM program's professional development by defining the vision and initiating collaborative workshops.

SKILLS AND INTERESTS*Skills:* SEO analysis, Google Analytics, wireframing, online and social business models, Excel, C++, C, Java, Python, MySQL*Interests:* black and white photography, alpine skiing, competitive knitting*Honor Societies:* Upsilon Pi Epsilon (ΥΠΕ) Computer Science; Eta Kappa Nu (ΗΚΝ) Electrical Engineering

Frances MacLean

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EDUCATION

- Thayer School of Engineering at Dartmouth College**, Hanover, NH June 2016
Ph.D. in Engineering Sciences; Concentration in Orthopaedic Biomaterials and Medical Devices
- Thesis: Optimization Techniques in Data Mining Applications to Biomedical Data Sets
 - Major Coursework: Biomedical Engineering, Intellectual Property, Corporate Law, Grant Writing
- Bachelor of Engineering; Concentration in Biomedical Engineering* June 2011
- Dartmouth College**, Hanover, NH June 2011
Bachelor of Arts in Engineering Sciences
- Major Coursework: Biomaterials, Polymer Chemistry, Mechanics of Materials, Physical and Organic Chemistries, Molecular and Cellular Biology, Biotechnology, Statics and Dynamics, Product Design, Numerical Analysis, Statistics.

WORK EXPERIENCE

- Dartmouth Biomedical Engineering Center**, Hanover, NH June 2016 – Present
Post-Doctoral Research Associate
- Devote 30+ hours per week toward the preparation of manuscripts to reduce the laboratory's backlog.
 - Mentor undergraduate and graduate students in orthopaedic biomaterials research.
- B.B.R. Medical Innovations, Inc.**, Hanover, NH July 2013 – Present
Co-founder
- Co-founder and co-director of a medical device startup aimed at reducing healthcare associated infections.
 - One of 6 teams accepted into 2012 Barris Incubator program at Tuck School of Business at Dartmouth College.
 - Semi-finalist, honorable mention in Dartmouth Ventures 2013 Business Plan Competition.
 - Chosen as a finalist and participated in the highly selective MassChallenge Accelerator Program.

OTHER ENGINEERING EXPERIENCE

- Dartmouth Biomedical Engineering Center**, Hanover, NH June 2011
- Designed low cost (under \$50) alternative femoral external fixation devices for third world countries.
- Thayer School of Engineering**, Hanover, NH April 2009
Intravenous Fluid Sterilization Device
- Collaborated with anesthesiologists to develop a novel method for disinfecting IV fluid.
 - Awarded 2009 Thayer School of Engineering Corporate Collaboration Council Engineering Design Prize.
- Maxillomandibular Fixation Device* June 2008
- Developed a novel approach to maxillomandibular fixation following traumatic injuries to the jaw.
- Nostril Sizing Ring* January 2008
- Teamed with surgeons at DHMC to develop a novel tool for maxillofacial surgeries.
 - Designed surgical instrument and worked through stages of testing including IRB approval.
- Deep Brain Stimulation* November 2007
- Optimized dopamine sensing probes used for deep tissue feedback loop.
 - Redesigned production method for probes to better maintain consistency across all units.

PATENTS

- US D652144: *Gauge For Determining Nostril Deformity*
- US 8747764: *Inline Intravenous Fluid Sterilizer*
- Patent Application: *Gauge For Determining Nostril Deformity and Method For Using The Same*

PUBLICATIONS

- MacLean F**, Currier BH, Van Citters DW, Levine RA, Collier JP. *Oxidation and other property changes of retrieved sequentially annealed UHMWPE acetabular and tibial bearings*. J Biomed Mater Res Part B. In Press.
- MacLean F**, Currier BH, Levine RA, Van Citters DW. *Crosslink density, oxidation and chain scission in retrieved, highly cross-linked UHMWPE tibial bearings*. Biomaterials 2014; 35(15):4436–40.

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SELECTED WORKS IN PROGRESS

MacLean F, Carlson EM, Levine RA, Van Citters DW. *Dynamical mechanical analysis as an assay of cross-link density of orthopaedic ultra high molecular weight polyethylene*. Sent to co-authors for review on 10/3/14.

MacLean F, Currier BH, Van Citters DW, Levine RA, Collier JP. *Oxidation and other property changes of a remelted highly cross-linked UHMWPE in retrieved tibial bearings*. Sent to co-authors for review on 10/17/14.

MacLean F, Currier BH, Van Citters DW, Levine RA, Collier JP. *In vivo oxidation in remelted HXL UHMWPE acetabular bearings: A clinical concern?* Sent to co-authors for review on 10/31/14.

SELECTED PRESENTATIONS

MacLean F, Levine RA, Currier BH, Mayor MB, Van Citters DW. *In Vivo Oxidation in Remelted Highly Cross-linked Acetabular Bearings: A Clinical Concern?* 2015 AAOS Annual Meeting. Las Vegas, NV. 2015.

MacLean F, Van Citters DW. *Crosslink Density Changes in Retrieved, Highly Cross-Linked UHMWPE Tibial Bearings Indicate Chain Scission Corresponding to in Vivo Oxidation*. 2013 ISTA Annual Congress. Palm Beach, FL. 2013.

MacLean F, Paniogue TJ, Van Citters DW. *A Method for Tribotesting of the Native Articular Surface of Retrieved Tibial Inserts*. 2013 ISTA Annual Congress. West Palm Beach, FL. 2013.

MacLean F, Currier BH, Franklin KJ, Collier JP. *Early Indications of Oxidative Degradation in Retrieved Annealed UHMWPE Bearings Resembles Gamma Sterilized Materials*. 2012 ORS Annual Meeting. San Francisco, CA. 2012.

SELECTED POSTER PRESENTATIONS

MacLean F, Currier BH, Collier JP, Levine RA, Mayor MB, Van Citters DW. *In Vivo Oxidation and Associated Changes in Sequentially Cross-link and Annealed UHMWPE Bearings*. 2015 AAOS Annual Meeting. Las Vegas, NV. 2015.

MacLean F, Currier BH, Levine RA, Van Citters DW. *Does In Vivo Oxidation in Highly Crosslinked Acetabular Components Lead to Chain Scission?* 2014 ORS Annual Meeting. New Orleans, LA. 2014.

MacLean F, Rezhdo A, Carlson EM, Currier BH, Collier JP. *Free radical changes in retrieved sequentially annealed UHMWPE bearings suggest chemical activity*. 2014 ORS Annual Meeting. New Orleans, LA. 2014.

MacLean F, Currier BH, Levine RA, Van Citters DW, Collier JP. *Comparison of oxidation rates and effects in sequentially annealed tibial, patellar, and acetabular bearings*. 2014 ORS Annual Meeting. New Orleans, LA. 2014.

MacLean F, Heard SN, Tibbo ME, Carlson EM, Currier BH, Collier JP. *Identification of Oxidized Regions in Retrieved, Highly Crosslinked UHMWPE Bearings Using Xylene Etching*. 2013 ORS Annual Meeting. San Antonio, TX. 2013.

MacLean F, Franklin KJ, Gray LT, Kluk HL, Currier JH, Van Citters DW. *Investigating the Usefulness of the Small Punch Test in Retrieval Analysis*. 2012 ORS Annual Meeting. San Francisco, CA. 2012.

MacLean F, Currier BH, Van Citters DW. *In Vivo Crosslink Density Changes in Highly Crosslinked UHMWPE Bearings*. 5th UHMWPE International Meeting. Philadelphia, PA: Drexel University. 2011.

MacLean F, Currier BH, Van Citters DW. *Crosslink Density Measurements of Two Retrieved, Highly Crosslinked Acetabular Cups*. 2011 ORS Annual Meeting. Long Beach, CA. 2011.

SELECTED ADVISING EXPERIENCE

Women in Science Program, Dartmouth College, Hanover, NH November 2013 – Present

- Research advisor in an internship program seeking to encourage women to pursue science and engineering.
- Mentor 19 first and second year female students in materials science, mechanical engineering, and design projects.
- 7 of 15 mentees who have completed their internships have chosen to continue working with the laboratory.

Biomaterials Research Advising, Dartmouth College, Hanover, NH September 2012 – Present

- Serve as a secondary advisor for 3 graduate students and 2 senior thesis students.
- Primary research advisor for 5 undergraduate researchers leading to 10 conference poster and paper presentations.

Thursday Night Salsa Club Advisor, Dartmouth College, Hanover, NH June 2012 – Present

- Assist undergraduate student leaders in development of weekly lessons.
- Help organize semi-annual community dances and supervise funding requests and allocation.

Frances MacLean

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PROFESSIONAL AND LEADERSHIP POSITIONS

- Thayer School Annual Fund Executive Committee**, Dartmouth College, Hanover, NH January 2016 – Present
Member, Sub-Committee for Young Alumni Class Agent Recruitment
- Graduate Program Committee**, Thayer School of Engineering, Hanover, NH June 2012 – March 2015
Student Representative to the MS/PhD Planning Committee
- ENGS 89/90 – Engineering Design Methodology**, Thayer School of Engineering, Hanover, NH May 2012 – May 2014
Design Review Board Member
- Participated in design review sessions for undergraduate capstone design sequence.
 - Evaluated projects based on design methodology, technical merit, and potential societal impact.
- Graduate Student Council**, Dartmouth College, Hanover, NH September 2011 – May 2013
Voting Representative for the Thayer MEM/MS/PhD Programs
- FIRST Lego League**, Dartmouth College, Hanover, NH August 2011 – Present
- Project Judge (2011-2013)
 - Head Referee (2014)
- CCFA Camp Oasis Pennsylvania**, Crohn's and Colitis Foundation of America May 2011 – Present
Volunteer. Co-director, Leaders in Training (LIT) Program
- Mentor 17-year-olds transitioning from campers to counselors at a camp for kids with Crohn's disease or colitis.
- Teaching Assistantships**, Thayer School of Engineering, Hanover, NH
- Teaching Assistant for ENGS 23 – Distributed Systems and Fields, Prof. Ulf Osterberg* March 2011-May 2011
- Section Leader, Engineering Workshops* September 2010 – June 2011
- Teaching Assistant for ENGS 22 – Systems, Prof. B. Stuart Trembly* June 2010 – August 2010
- The Daily Dartmouth**, Dartmouth College, Hanover, NH September 2009 – June 2010
Senior Design Editor, Editorial Board Member
- Led team of 22 layout and design editors, scheduling shifts and managing all sections.
 - Responsible for recruiting and training new staff members.

AWARDS

- Dean's Service Award**, Thayer School of Engineering June 2016
In recognition of exceptional contributions to Thayer School, Dartmouth College or the broader world.
- MassChallenge Accelerator Program, Finalist** March 2015
- Corporate Collaboration Council Engineering Design Prize, Thayer School of Engineering** June 2011
Recognizes the group with the best overall performance in course sequence in engineering design methodology

PROFESSIONAL ORGANIZATIONS AND CERTIFICATIONS

- Sigma Xi, Full Member** 2016 – Present
- American Association for the Advancement of Science, Sponsored Member** 2012 – Present
- Orthopaedic Research Society, Associate Member** 2011 – Present
- American Society of Mechanical Engineers, Student Member** 2010 – Present
- Fundamentals of Engineering (EIT), NH Joint Board of Licensure and Certification** June 2011