

# **MATTHEW J. TRAUM, Ph.D.**

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## **EDUCATION**

### **MASSACHUSETTS INSTITUTE OF TECHNOLOGY**

**Doctor of Philosophy in Mechanical Engineering**, June 2007

Minor in Nanotechnology/Microtechnology Fabrication and Manufacturing, June 2007

**Master of Science in Mechanical Engineering**, June 2003

### **UNIVERSITY OF CALIFORNIA, IRVINE**

**Bachelor of Science in Aerospace Engineering**, June 2001 (Cum Laude)

**Bachelor of Science in Mechanical Engineering**, June 2001

Minor in Women's Studies, June 2001

### **UNIVERSITY OF BRISTOL, UNITED KINGDOM**

Education Abroad Program in Aerospace Engineering, 1999-2000

## **UNIVERSITY & INDUSTRY EXPERIENCE**

**Senior Lecturer & Instructional Associate Professor, Mechanical & Aerospace Engineering Dept., Gainesville, FL**  
**University of Florida** Aug. 2019-Present

*Report To Department Chair: Professor Warren Dixon, Ph.D.*

- Founder & PI of UF GatorKits Laboratory, which designs, builds, tests, and distributes educational STEM lab kits
- Teaches the mechanical engineering Capstone sequence (design & realization) with ~100 students per semester
- MERGE (MEchanical engineeRing pedaGogy dEsign) Co-Investigator researching large enrollment lab instruction

**Founding Chief Executive Officer (CEO),**  
**Engineer Inc.**

**Nashville, TN & Gainesville, FL**  
June 2016 – Sept. 2022

*Reported To Engineer Inc's Board of Directors*

- Negotiated successful exit through acquisition of the business by an educational institution in 2022
- Managed legal creation, product development, sales, and daily operation of a start-up education technology company
- Invented, designed, built, & tested educational laboratory equipment for college-level mechanical engineering courses
- Created in WordPress engineering online curricula, manuals, videos, and content to compliment laboratory equipment

**Director and Associate Professor, Engineering & Mechanical Engineering Programs**  
**Philadelphia University (PhilaU)**

**Philadelphia, PA**  
Aug. 2014-May 2016

*Reported To Academic Dean: Associate Professor Michael J. Leonard, MA.Ed., IDSA*

- **Administrative Head** overseeing seven full-time engineering faculty in four degree-granting programs:
  - B.S.E. Engineering (ABET-Accredited)
  - B.S.E. Mechanical Engineering (ABET-Accredited)
  - M.S. Textile Engineering
  - Ph.D. Textile Science and Engineering
- Conducted Mechanical Eng. program through successful ABET Interim Visit resulting in NO deficiencies / concerns
- Evaluated teaching effectiveness and gave continuous feedback to junior faculty toward promotion and tenure

**Assistant Professor, Department of Mechanical Engineering,**  
**Milwaukee School of Engineering (MSOE)**

**Milwaukee, WI**  
Aug. 2011-Aug. 2014

*Reported To Department Chair: Professor Matthew A. Panhans, Ph.D.*

- Conducted experimental research on sustainable biomass-to-heat-&-power, aquaponic agriculture, & thermal transport
- Coordinated MSOE's first ever crowd-funded undergraduate research project; raised \$2,500 through Microryza.com
- Co-Founded 2 start-up companies with undergraduate students; raised \$20,000 in seed funding
- Founded Association of Energy Engineers (AEE) and ΣΣΠ (Energy Engineering Honors Society) student chapters

**Founding Chief Technology Officer (CTO),  
EASENET, Inc.**

**Milwaukee, WI**  
Jan. 2012 – July 2014

*Reported To President & CEO: Mr. Jeremy Anderson (A Former Student)*

- Led a team of 4 engineers to design, build, & test a residential-scale flexible fuel combined heat & power system
- Oversaw design, fabrication, & testing of prototype solar-fired pyrolysis processor for biomass-to-heat-and-power
- Solved technical challenges arising from synthesis & combustion of wood gas for residential heat & power creation
- Established market & business model for early-phase start-up via customer discovery, development, & validation

**Founding Faculty & Assistant Professor, Department of Mechanical & Energy Engineering,  
University of North Texas (UNT) College of Engineering**

**Denton, TX**  
June 2007-Aug. 2011

*Reported To Department Chair: Professor Yong X. Tao, Ph.D.*

- Co-Founded department with 3 faculty colleagues: created curriculum, recruited students, established facilities
- Conducted experimental research: sustainable solar power, energy storage & energy efficiency in the built environment
- Established the Texas Undergraduate Researcher Incubator (TURI) to engage undergraduates in engineering research
- Attracted 1<sup>st</sup> start-up to UNT Discovery Park Incubator – Solar Logic, a distributed concentrated solar power company

**RESEARCH**

**PUBLICATIONS**

*Dr. Traum's career peer reviewed scholarly output includes 1 book chapter and 17 research articles & 4 pedagogical articles published in refereed journals, 23 research articles published in refereed conference proceedings, and 34 pedagogical articles published in refereed conference proceedings.*

***Selected Peer-Reviewed Journal Publications (Reverse Chronological Order)***

S. K. S. Boetcher, J. B. Perskin, Y. Maidenberg, **M. J. Traum**, T. von Hippel, "Direct Atmospheric Cryogenic Carbon Capture in Cold Climates," *Carbon Capture Science & Technology*, Vol. 8, 2023.

**M. J. Traum**, J. Mishur, "Thermoelectric Power Production Efficiency Can Surpass Photovoltaics Under Concentrated Sunlight Due to High-Temperature Performance Degradation," *International Journal of Applied Energy Systems*, Vol. 5, Issue 2, pp. 13-30, 2023.

**M. J. Traum**, A. L. Provost, J. Doherty, "STEMTank – Implementing Online an Engineering Summer Camp for Underprivileged High School Students in Response to COVID-19," *Opportunity Matters: Journal of Access and Opportunity in Education*, Published by the Pell Institute for the Study of Opportunity in Higher Education, Vol. 4, 2022.

**M. J. Traum**, J. Fiorentine, "Rapid Evaluation On-Line Assessment of Student Learning Gains for Just-In-Time Course Modification," *Journal of Online Engineering Education*, Vol. 12, No. 1, Article 2, June 2021.

L. E. Rogers, K. J. Stubbs, N. A. Thomas, S. R. Niemi, A. Rubiano, **M. J. Traum**, "Transitioning Oral Presentations Online in Large-Enrollment Capstone Design Courses Increases Panelist Participation," *Advances in Engineering Education*, Vol. 8, No. 4, Fall 2020. [ASEE AEE journal Featured Article, December 2020]

**M. J. Traum**, F. Hadi, "A Miniaturized Circular Hydraulic Jump for Remote On-Line Fluid Mechanics Instruction," *Journal of Online Engineering Education*, Vol. 10, No. 1, Article 3, June 2019.

**M. J. Traum**, F. Hadi, M. K. Akbar, "Extending 'Assessment of Tesla Turbine Performance' Model for Sensitivity-Focused Experimental Design," *ASME Journal of Energy Resources Technology*, Vol. 140, Number 3, March 2018, pp. 032005-1 to 032005-7. DOI: 10.1115/1.4037967

**GRANTS, FELLOWSHIPS, AND FUNDING**

*Dr. Traum's career accumulation of awarded competitive grants, monetary prizes, fellowships, and venture capital as a PI or Co-PI totals \$927,271. Of this sum, \$751,996 was awarded for research & development and \$175,275 was for*

*education. Of the whole, \$789,745 was from external sources while \$137,526 was from internal sources. Of the total \$889,126 was for educational institutions, \$30,000 was start-up venture capital, and \$8,145 was non-profit fundraising.*

**Selected Funding Examples (Reverse Chronological Order)**

“RaveBio™ Orbital Biological Shaker Table,” University of Florida Warrington College of Business Big Idea Business Plan Competition, \$10,000, N. A. Saavedra (PI), D. H. Latta (Co-PI), J. E. Rutenberg (Co-PI), D. A. Navarrete (Co-PI), A. Cipriani (Co-PI), W. T. O’Byran (Co-PI), K. B. Verlangieri (Co-PI), T. Sun (Co-PI), **M. J. Traum (Director)**, submitted April 20, 2023.

“IncuGator™ High School Summer STEM Camp,” Children’s Trust of Alachua County, \$12,240, **M. J. Traum (PI)**, submitted Feb. 15, 2022.

“Natural Trumpet Brass Instrument Design Teaching Kits for K-12 Schools,” Les Paul Foundation, \$10,567, B. Elgan (PI – UF School of Music), **M. J. Traum (Co-PI)**, S. R. Niemi (Co-PI), submitted Sept 15, 2021.

“STEM Tank: A Summer Coding/CAD/3D-Printing Engineering Camp for Underprivileged High Schoolers from Six Surrounding Counties,” U.S. Department of Education (subcontract through Santa Fe College), \$23,000 (2020), \$4,999 (2022), \$4,999 (2023) **Matthew J. Traum (PI)**, submitted October 25, 2019.

“Atmospheric CO<sub>2</sub> Cryogenic Sequestration,” Embry-Riddle Aeronautical University Faculty Innovative Research in Science and Technology (FIRST) Program, \$25,000, S. K. S. Boetcher (PI), T. von Hippel (Co-PI), F. Azadian (Co-PI), W. MacKunis (Co-PI), **M. J. Traum (Industry Collaborator)**, submitted Jan. 25, 2019.

**PROFESSIONAL SERVICE, ACTIVITIES & VOLUNTEERISM**

**HONOR SOCIETY AFFILIATIONS**

- Sigma Xi International Scientific Research Honor Society, Full Member, 2007-present, Associate Member, 2003-07
- Tau Beta Pi National Engineering Honor Society, Lifetime Member, 1998-present
- Phi Beta Kappa National Honor Society, Lifetime Member, 1998-present
- Pi Tau Sigma National Mechanical Engineering Honor Society, Lifetime Member, 1999-present
- Sigma Gamma Tau National Aerospace Engineering Honor Society, Lifetime Member, 2008-present
- Sigma Sigma Pi National Energy Engineering Honor Society, Lifetime Member, 2009-present

**SELECTED PROFESSIONAL SERVICE**

- Associate Editor, Journal of Online Engineering Education (JOEE), 2020-present
- Executive Board Member – PreK-12 Representative ‘Other’: American Society for Engineering Education (ASEE) Pre-College Engineering Education (PCEE) Division, 2020-2022
- Chair: American Society for Engineering Education (ASEE) Pre-College Engineering Education (PCEE) Division Awards Committee, 2020-2021; Member, 2019 - 2020
- Evaluator: Louisiana Board of Regents Industrial Ties Research Subprogram – Advanced Materials and Manufacturing Panel, 2015, 2016, 2017, 2018, 2019, 2020, 2021
- Reviewer: ASME Journal of Thermal Science and Engineering Applications
- Reviewer: Proceedings of the ASEE Annual Conference: 2009, 2013, 2014, 2016, 2017, 2018, 2019, 2020, 2021
- Reviewer: Proceedings of the ASEE Southeastern Section Conference: 2018, 2019, 2020, 2021

**AWARDS**

- University of Florida Mechanical & Aerospace Engineering Dept. Excellence in Teaching Innovation Award, 2023
- University of Florida Superior Accomplishment Award for Community Service, Division 3 – Academic Affairs, 2021
- WACE Exemplary Practice Award, 1<sup>st</sup> Place for STEMTank, Association of Florida Colleges Workforce Adult & Continuing Education Commission (WACE), 2020: <https://youtu.be/f5g8SAyaetg>