

Katherine Ramos

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EDUCATION

- UNIVERSITY OF NOTRE DAME** Notre Dame, IN
PhD in Mechanical Engineering, GPA: 3.72 May 2021
Minor in Computational Science and Engineering
Thesis Topic: "Advancing the Integrated Computational Materials Engineering Paradigm"
- UNIVERSITY OF NOTRE DAME** Notre Dame, IN
MS in Mechanical Engineering, GPA: 3.70 Jan 2018
- THE UNIVERSITY OF TEXAS AT EL PASO** El Paso, TX
BS in Metallurgical and Materials Engineering, GPA: 3.97 (summa cum laude) May 2014
Presidential Scholar, Michael & Susan Dell Foundation Scholar

PROFESSIONAL EXPERIENCE

- THE UNIVERSITY OF COLORADO BOULDER** Boulder, CO
Teaching Assistant Professor– Engineering Plus Aug 2021 - Present
- Teaching project-based courses in the Engineering Plus program.
 - Teaching engineering design in First-Year Engineering Projects and Engineering Drawing.

RESEARCH EXPERIENCE

- THE UNIVERSITY OF NOTRE DAME** Notre Dame, IN
Graduate Research Assistant – Integrated Computational Materials Engineering Aug 2014 - May 2021
- Investigated the influence of microstructure and damage phenomenon on the effective mechanical response of composites using 3D image-based modeling techniques to enable faster research and development time cycles.
 - Formulated and established a thorough non-destructive, 3D image-based analysis where reliable experimental and image processing frameworks provide insight to the optimization of material design at lower cost.
 - Developed a multi-disciplinary data-driven experimental and computational framework to reduce product-to-market time frames of new materials using statistical characterization methods.

- INTEL** Hillsboro, OR
Hardware Engineering Intern – Thermal and Mechanical Systems Engineering Sep 2017 - Dec 2017
- Led development of novel material used to improve device durability, increase performance, and drive down costs.
 - Improved burst performance of laptop devices by 40% using novel thermal capacitance phase-change material.
 - Incorporated the use of 3D printed design tools to achieve consistent and reliable results.

- LOS ALAMOS NATIONAL LABORATORY** Los Alamos, NM
Research Intern – Materials Science and Technology Division May 2016 - Aug 2016
- Initiated and executed collaboration with a research team of 4 on an image-based modeling project formulating comprehensive non-destructive experimental and image analysis protocols to serve as a new streamlined standard.
 - Extended this collaborative effort and protocols with a cross-country national laboratory, Argonne.

- THE UNIVERSITY OF TEXAS AT EL PASO** El Paso, TX
Undergraduate Research Assistant – Metallurgical and Materials Engineering Jan 2014 - May 2014
- Investigated and proposed alternative materials and designs for a prosthetic knee providing failure preventative measures (*this work was part of a non-profit organization, LIMBS International, committed to developing affordable and high-quality prosthetic limbs for people living in underdeveloped nations.*)

- UNIVERSITY OF CALIFORNIA SANTA BARBARA** Santa Barbara, CA
Summer Engineering Research Experience – Chemical Engineering Jun 2013 - Aug 2013
- Executed a comprehensive screening of materials by conducting controlled "living" free radical co-polymerizations where successful controlled co-polymerizations served as a baseline for continued research.

- ARMY RESEARCH LABORATORY** Aberdeen, MD
Student Internship – Materials Engineering Jun 2012 - Aug 2012
- Performed quality control and studied mechanical property effects of innovative titanium hydride powders providing a cost-effective alternative to existing commercially available wrought titanium components.

TEACHING EXPERIENCE

ENGINEERING PROJECTS

GEEN 1400

Teaching Assistant Professor, University of Colorado Boulder

Fall 2021

- Taught two project-based courses to introduce students to design engineering.

ENGINEERING PROGRAMMING

EG 10116

Instructor of Record

Spring 2021

- Taught two engineering programming sections to introduce students to MATLAB and Python.

ENGINEERING PROJECTS

EG 10115

Instructor of Record

Fall 2020

- Taught two project-based courses using SolidWorks to create engineering drawings and Excel to analyze data.
- Collaborating with other instructors to develop course material; lectures, projects, homework, and examinations.

LEADERSHIP & SERVICE

SOCIETY OF WOMEN ENGINEERS – SWE

Boulder, CO

Faculty Advisor

Aug 2021 - Present

- Serving as faculty advisor for the undergraduate and graduate sections of the Society of Women Engineers.
- Led efforts to create a graduate section of SWE at CU Boulder.

STEM ROUTES

Boulder, CO

Faculty Advisor

Aug 2021 - Present

- Serving as the faculty advisor for the graduate-student led organization that seeks to create an inclusive and supportive community for students in STEM.

SOCIETY OF WOMEN ENGINEERS – SWE

Notre Dame, IN

Chapter President, Vice-Chair, and Member

May 2016 - Present

- Directed the leadership team of 8, as vice-chair and later as President, to completely revamp the organization by implementing productivity tools such as *Slack*, *MailChimp*, and *G Suite*.
- Secured a yearly budget approval ($> \$1,800$) for events providing resources leading to more women engineering students obtaining internships with companies and acquiring coveted positions upon graduation.
- Increased student participation year after year and acquired a 180% budget increase ($> \$5,000$) as a result.

ASSOCIATION OF WOMEN IN SCIENCE – AWIS

Notre Dame, IN

Outreach Committee Member

Jun 2016 - Oct 2016

- Organized funding committee to secure community financial support ($> \$30,000$) for the inaugural Regional Women in Science Conference for female graduate students, which was the 1st of its kind in the Midwest region.
- Led 8 workshops for the Expanding Your Horizons conference aimed at introducing, inspiring, and educating middle school girls about careers in math, science, and engineering.

GRADUATE EDUCATORS TEACHING STEM

Notre Dame, IN

Community Outreach Ambassador

Feb 2016 - May 2017

- Tutored and mentored 2 at-risk and underrepresented minority middle school students at the Robinson Community Learning Center for 2 consecutive semesters and later supported the program through SWE.
- Coached 3 students on math and reading skills in 1-on-1 sessions leading to improved STEM and reading proficiency.

Outreach Activities: LearningSphere Science Fair Judge – 2019, Expanding Your Horizons volunteer – 2017

PUBLICATIONS

- Journals**
- [1] S. Lee, **K. Ramos**, and K. Matouš, "Numerical study of damage in particulate composites during high-strain rate loading using novel damage model", *Mechanics of Materials*, (*In review*).
 - [2] **K. Ramos** and K. Matouš, "Micro-computed tomography based experimental investigation of micro- and macro-mechanical response of particulate composites with void growth", *Philosophical Magazine*, 98, 3049-3071 (2018).
- Conferences**
- [1] **K. Ramos**, S. Lee, and K. Matouš, "Co-designed Image-based Experimental and Computational Investigation of Damage in Particulate Composites", *15th U.S. National Congress on Computational Mechanics*, Austin, Texas, July 28-Aug. 01, 2019.
 - [2] **K. Ramos** and K. Matouš, "Linking Microstructure to the Effective Mechanical Response in Particulate Composites Subjected to Uniaxial Compression using X-ray Micro-CT", *55th Annual Technical Meeting of the Society of Engineering Science*, Madrid, Spain, October 10-12, 2018.
 - [3] **K. Ramos** and K. Matouš, "Using Micro-computed Tomography for Image-based Material Testing of Particulate Composites to Quantify Microscale Damage", *13th World Congress in Computational Mechanics*, New York City, NY, July 22-27, 2018.
 - [4] **K. Ramos** and K. Matouš, "Understanding Mechanical Response through Image-based Material Testing of Particulate Composites using Micro-tomography", *54th Society of Engineering Science*, Boston, MA, July 25-28, 2017.
 - [5] **K. Ramos** and K. Matouš, "Quantifying Microscale Damage through Image-based Material Testing of Particulate Composites using Micro-tomography", *14th U.S. National Congress on Computational Mechanics*, Montreal, Canada, July 17-20, 2017.

HONORS & AWARDS

GRADUATE SCHOLARSHIP RECIPIENT Women & Hi Tech	2019
RISING STARS AWARD Oden Institute for Computational Engineering and Sciences - University of Texas at Austin	2019
OUTSTANDING GRADUATE STUDENT TEACHER AWARD Kaneb Center for Teaching and Learning	2018
GEM PH.D. ENGINEERING FELLOW The National GEM Consortium, sponsored by Intel Corporation	2017
INTEL FOUNDATION SCHOLARSHIP RECIPIENT Great Minds in STEM: HENAAC Scholars Program	2016

PROFESSIONAL MEMBERSHIPS

Professional Affiliations: American Society for Engineering Education, Women & Hi Tech, Society of Women Engineers (SWE), Society of Hispanic Professional Engineers (SHPE)

SKILLS

Languages: English – native, Spanish – fluent

Programming Languages: C++, MATLAB Script, Python, Wolfram

Desktop Editing and Productivity Software: Microsoft Office, LATEX, Google Docs

REFERENCES

Dr. Karel Matouš

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