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# Biographical Data for Promotion/Tenure Review

## I.

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| **Last Name** | **First Name and Initial** | **Exact Rank and Title of Position** |
| Kraft | Reuben H. | Professor of Mechanical Engineering |
| **College** | **Department/Division/School** | **Location of Residence** |
| College of Engineering | EN - Mechanical Engineering | University Park |

## II. ACADEMIC TRAINING

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| --- | --- | --- | --- |
| **Name and City/State of Institution** | **Major Subjects** | **Minor Subjects** | **Degrees - Dates** |
| U.S. Army Research Laboratory, Aberdeen Proving Ground, Maryland | Mechanics |  | Post-Doctoral, May 2008 - May 2009 |
| The Johns Hopkins University, Baltimore, Maryland | Mechanical Engineering |  | Ph D, May 2008 |
| The Johns Hopkins University, Baltimore, Maryland | Mechanical Engineering |  | MS, May 2006 |
| University of Maryland, Baltimore County (UMBC), Baltimore, Maryland | Mechanical Engineering |  | BS, December 2003 |

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| **Professional Status - Law, CPA, Other Degrees and Licenses Held** | **Honorary Degree(s) - Institution** |
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## III. Academic, Government, Military, and Professional Positions

|  |  |  |  |
| --- | --- | --- | --- |
| **Previous Employers with City/State**  **Including U.S. Military**  **(Most Recent First)** | **Work Performed: If Teacher, List Subjects Taught** | **Rank or Title** | **Dates** |
| The Pennsylvania State University  University Park, PA | Responsible for teaching undergraduate and graduate level classes in engineering and leading basic research in the area of computational biomechanics. | Associate Professor of Biomedical Engineering (Courtesy) | July 2019 - June 2024 |
| The Pennsylvania State University  University Park, PA | Responsible for teaching undergraduate and graduate level classes in engineering and leading basic research in the area of computational biomechanics. | Associate Professor of Mechanical Engineering | July 2019 - June 2024 |
| The Pennsylvania State University  University Park, PA | Responsible for teaching undergraduate and graduate level classes in engineering and leading basic research in the area of computational biomechanics. | Assistant Professor of Biomedical Engineering (Courtesy) | July 2016 - June 2019 |
| The Pennsylvania State University  University Park, PA | Responsible for teaching undergraduate and graduate level classes in engineering and leading basic research in the area of computational biomechanics. | Assistant Professor of Mechanical Engineering | August 2013 - June 2019 |
| The Johns Hopkins University Applied Physics Laboratory, Research and Exploratory Development Department, Biomechanics and Injury Mitigation Systems Group | Responsible for conducting and leading basic and applied research in the area of computational biomechanics associated with modeling the human body response in dynamic events. | Lead Researcher of Computational Biomechanics | June 2012 - June 2013 |
| The U.S. Army Research Laboratory, Soldier Protection Sciences Branch | Responsible for conducting and leading basic and applied research in the area of computational biomechanics associated with humans in extreme environments. | Mechanical Engineer | February 2009 - June 2012 |
| Oak Ridge Associated Universities at The U.S. Army Research Laboratory, Impact Physics Branch | Responsible for conducting basic and applied research in the area of computational biomechanics associated with humans in extreme environments. | Post-Doc | May 2008 - February 2009 |

## IV. PREVIOUS SABBATICALS AT THE PENNSYLVANIA STATE UNIVERSITY

|  |  |  |
| --- | --- | --- |
| **Activity or Project** | **Results: Publications, Reports, etc.** | **Dates** |
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| --- | --- |
| (07-01-2021) | Form GF4.21b |

# Narrative Statement

I joined the faculty of The Pennsylvania State University as an Assistant Professor of Mechanical Engineering in August 2013. I was promoted to Associate Professor with Tenure in June of 2019. Prior to joining Penn State, I earned a Ph.D. from Johns Hopkins University (2008), worked as an engineer at the U.S. Army Research Laboratory (2008-12), and served as the “Lead Researcher of Computational Biomechanics” at The Johns Hopkins University Applied Physics Laboratory (APL). For my efforts in computational mechanics at the Army Research Laboratory, I was awarded the Presidential Early Career Award for Scientists and Engineers (PECASE) in 2011. At Penn State, I was selected as the inaugural Shuman Assistant Professor of Mechanical Engineering (2013-16). I also hold a courtesy appointment in the Department of Biomedical Engineering. I am a co-hire in the Institute for Computational and Data Science and am affiliated with the Center for Neural Engineering and the Center for Biodevices. My expertise lies primarily in computational mechanics and has mainly focused on computational biomechanics, but since 2019, I have also been developing an experimental component of my research that focuses on high strain rate material characterization and modeling of composites. I pioneered a computational method called the embedded element technique for dynamic explicit finite element methods, which can be applied to modeling the brain as well as composites–both of which share a fibrous microstructure. The embedded element technique has been adopted by researchers worldwide.  
  
My primary research endeavor over the past five years since tenure has been characterized by the significant development and global adoption of the “Brain Simulation Research Platform”. Initially developed as part of my NSF CAREER Award, the project has seen vast growth and substantial external interest. A landmark achievement was the use of the Brain Simulation Research Platform in a pioneering study I was part of published in JAMA Network Open in 2023. This journal has an impact factor of 13.37, one of the highest among general medicine open access journals, underscoring the practical significance and impact my research is having. In this study, my research group applied the platform to simulate about 9500 head impacts in football, marking the first instance of establishing a correlation between brain strain and changes in blood biomarkers resulting from repetitive head impacts in high school football.  
   
Over the last year, more than 70,000 finite element-based brain simulations have been completed on the platform by researchers and companies from around the world. This includes companies like Prevent Biometrics, HitIQ (Australia), and Athlete Intelligence (USA), all involved in instrumented mouthguard technologies. Additionally, institutions like Children’s Hospital of Philadelphia, University of Ulster in the UK, Indiana University, University of North Carolina-Greensboro, and the University of Otago (New Zealand) have utilized the platform for their research. The influence of the platform extends far beyond the United States, and its application spans various sports, including football, soccer, lacrosse, rugby, and bobsledding, broadening its scope and impact. Beyond sports, the platform has also proven valuable for military research. The U.S. Army Research Laboratory and the Canadian Defense Laboratory have utilized it to understand blast impacts, thus expanding the application spectrum to encompass crucial aspects of brain health in critical scenarios. In order to transition this technology, I established a start-up company called BrainSim Technologies, Inc. This company has successfully sold over 18,000 brain simulations and has entered into an agreement to secure funding for navigating the technology through the FDA clearance process as a Software as a Medical Device (SaMD).  
   
The research from my group has resulted in three invention disclosures plus more than 70 publications, including 28 peer-reviewed journal articles, with most having my advisees as co-authors. My work has been cited more than 924 times, corresponding to a h-index of 15. At Penn State, I have helped secured more than $7.4M in funding (of which my share is approximately $5.7M). This includes funding from the Department of Defense, Department of Energy, National Institute of Health, National Science Foundation, Chuck Noll Foundation, Defence Research and Development Canada (DRDC)/Biokinetics, CFDRC Research Corporation and Penn State.  
   
I am currently mentoring 2 doctoral students (1 post-comprehensive) and a master’s student. I have advised 6 Ph.D. students to completion, along with 1 postdoctoral fellow, 8 M.S. students, and 21 undergraduate researchers (including 9 Schreyer and 2 Millennium scholars). It's worth noting that I have mentored 4 Ph.D. students post-tenure. My commitment to diversity is evident as more than 50% of my former and current Penn State students are either female or from underrepresented minorities. The career paths of my advisees span various industries including Tesla, Sikorsky, Ford, Cummins, and Computational Fluid Dynamics Research Corporation (CFDRC). I take a hands-on approach in working with my graduate students and mentees. From providing instruction to assisting with experimental setups and offering basic tutorials on the Linux command line, I prioritize spending quality time with my students. My interactions with them have always been a rewarding and valuable investment. In recognition of my research contributions, since joining Penn State, I have had the privilege of being invited to deliver 3 keynote or plenary lectures and have participated in over 10 invited seminars.  
   
My service commitments have been numerous both within and beyond the university. External to the University, I served as an elected Member-at-Large for the American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress & Exposition (IMECE) Steering Committee. Later on, I was elected as Vice Technical Chair of the IMECE, which is ASME's flagship conference. This elected role not only reflects my dedication to the profession but also underscores my reputation within the organization. Furthermore, I took on the role of co-organizer for the Biomedical and Biotechnology Track for ASME IMECE, sponsored by the ASME Bioengineering Division. Within this track, I've been co-organizing the Damage and Injury Biomechanics Topic symposium since 2014, and it consistently stands out as the largest topic in the track.  
   
I have contributed as a peer reviewer for numerous government organizations and more than 15 different peer-reviewed journals. Currently, I am actively serving as an Associate Editor for the ASME Journal of Engineering and Science in Medical Diagnostics and Therapy. My involvement extends to the University community as well. For instance, I participated in the Brain U search committee for the Center of Neural Engineering and was part of the search committee for Faculty in AI for Aerospace Vehicle Design. I also took up the co-chair position for the ICDS Coordinating Committee, and starting in August 2023, I'll be transitioning to the role of chair for the same committee.  
   
At the college level, I was engaged in the Leonhard Center CAREER Learning Community, which aimed to enhance the impact of my courses and support my growth as an educator. Within my department, I contributed to the ME Strategic Planning committee and the Mechanical Engineering Promotion and Tenure Committee, among other roles. Furthermore, I provided support to graduate students by serving on defense or thesis committees for several students. Beyond academia, I maintain a strong presence in my community through various organizations.  
  
In terms of teaching, I frequently teach ME 330 (Computational Tools for Mechanical Engineers), a class I helped develop, which is now a core, required course for mechanical engineering students. I also teach ME 360 (Machine Design), ME 461 (Introduction to Finite Element Analysis), and ME 563 (Nonlinear Finite Element Analysis). My impact on teaching includes the development of a computational solid mechanics “course pipeline” that spans from the third year to graduate students. This pipeline proved to be well-suited for remote learning during the Covid-19 Pandemic, enabling engaging hands-on lectures even in a distance learning setting.  
   
Since joining Penn State, I have had the opportunity to teach a total of 2,307 students as of August 2023, with 1,564 of those students being taught while I held the position of an associate professor. I have taken the initiative to create high-quality instructional videos for all of these courses and have made them accessible on YouTube for students and scholars worldwide. These videos have garnered more than 98,900 views and a total of 11,377 hours of watch time. According to student ratings, I typically score in the 6 or 7 range for the mean value of teaching scores.  
   
My dedication to teaching excellence has been recognized as I received an Outstanding Teaching Award from the Penn State Engineering Alumni Society (PSEAS) in 2018. Additionally, in 2022, I was granted the opportunity to participate in the inaugural Entrepreneurial Mindset for Innovative Teaching (EMIT) Academy sponsored by the Penn State Leonhard Center. This multi-week course was aimed at expanding the impact of my courses and further enhancing my teaching practices.

I have reviewed the contents of my dossier, with the exception of confidential materials, as defined in the AC23 Guidelines.

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|  |  |  |
| Candidate Signature |  | Date |



# THE SCHOLARSHIP OF TEACHING AND LEARNING

This section contains the following in reverse chronological order with the most recent date listed first:

• List of credit courses taught at Penn State for each semester with enrollments in each course

• List of non-credit courses and workshops taught in support of outreach-based instruction

• Concise compilation of results of student feedback from multiple sources, documented evaluation of candidate’s programs, activities, and skills in relating to clientele

• List of advising responsibilities

• Other evidence of resident and/or outreach-based teaching and advising effectiveness (e.g., performance of students in subsequent courses; tangible results and benefits derived by clientele; recipient of teaching and advising awards)

• Supervision of, and membership on, graduate and undergraduate dissertations, theses, projects, monographs, performances, productions, and exhibitions required for degrees; types of degrees and years granted

• Faculty input concerning the evaluation of teaching effectiveness, including any statements from colleagues who have visited the candidate’s classroom and evaluated his or her teaching, or who are in good position to evaluate outreach-based instruction or advising

• Peer review shall consider a range of teaching activities including, but not limited to, the development of materials such as case studies and class assignments, course or teaching portfolios, advising, research collaboration, and graduate student mentoring.    Internal letters about teaching effectiveness should be included in this section.

• Any statements from administrators which attest to the candidate’s teaching and advising effectiveness

• If student comments from such sources as student evaluations, formal interviews, or exit surveys are reviewed, the findings should be presented by a summary statement that conveys the students’ sense of strengths and weaknesses

(07-01-2023)

# THE SCHOLARSHIP OF TEACHING AND LEARNING

## List of Credit Courses Taught at Penn State for Each Semester with Enrollments in Each Course

### Fall 2024

ME 330-001, Computational Tools, UP. 3 credits, 238 Student(s), 50% responsibility, Primary Instructor, Remote Asynchronous, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 59 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 59 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 60 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 60 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 461-001, Finite Elem Enger, UP. 3 credits, 49 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture. (Cross-listed with ME 461.)

ME 596-027, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-028, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2024

ME 596-001, Individual Studies, WC. 3 credits, 1 Student(s), 100% responsibility, Primary Instructor, Remote Asynchronous, Independent Study.

ME 600-027, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Spring 2024

ME 330-001, Computational Tools, UP. 3 credits, 173 Student(s), 50% responsibility, Primary Instructor, Remote Asynchronous, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 45 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 42 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 45 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 41 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 563-001, Nonlin Finite Elem, WC. 3 credits, 20 Student(s), 100% responsibility, Primary Instructor, Remote Asynchronous, Lecture. (Cross-listed with ME 563.)

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 14 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture. (Cross-listed with ME 563.)

ME 596-002, Individual Studies, WC. 3 credits, 1 Student(s), 100% responsibility, Primary Instructor, Remote Asynchronous, Independent Study.

ME 596-021, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-021, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Fall 2023

ME 330-001, Computational Tools, UP. 3 credits, 201 Student(s), 50% responsibility, Primary Instructor, Remote Asynchronous, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 53 Student(s), 50% responsibility, Primary Instructor, In Person, Laboratory.

ME 330-002L, Computational Tools, UP. 3 credits, 49 Student(s), 50% responsibility, Primary Instructor, In Person, Laboratory.

ME 330-003L, Computational Tools, UP. 3 credits, 55 Student(s), 50% responsibility, Primary Instructor, In Person, Laboratory.

ME 330-004L, Computational Tools, UP. 3 credits, 44 Student(s), 50% responsibility, Primary Instructor, In Person, Laboratory.

ME 596-027, Individual Studies, UP. Variable credits, 3 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-028, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2023

ME 360-001, Mechanical Design, UP. 3 credits, 34 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, UP. 3 credits, 30 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 15 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 600-027, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Spring 2023

ME 330-001, Computational Tools, UP. 3 credits, 156 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 42 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 43 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 41 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 600-021, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Fall 2022

ME 330-001, Computational Tools, UP. 3 credits, 239 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 61 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 59 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 60 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 59 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 600-027, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2022

ME 360-001, Mechanical Design, UP. 3 credits, 40 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, UP. 3 credits, 39 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 16 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 596-008, Individual Studies, WC. 1 credits, 1 Student(s), 100% responsibility, Primary Instructor, Web, Independent Study.

### Spring 2022

ME 494H-016, Senior Thesis, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Research.

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 11 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture. (Cross-listed with ME 563.)

ME 563-001, Nonlin Finite Elem, WC. 3 credits, 9 Student(s), 100% responsibility, Primary Instructor, Web, Lecture. (Cross-listed with ME 563.)

ME 600-026, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Fall 2021

ME 330-001, Computational Tools, UP. 3 credits, 220 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 32 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 32 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-005L, Computational Tools, UP. 3 credits, 32 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-006L, Computational Tools, UP. 3 credits, 32 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 330-007L, Computational Tools, UP. 3 credits, 32 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture.

ME 494H-022, Senior Thesis, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Research.

ME 596-003, Individual Studies, WC. 3 credits, 1 Student(s), 100% responsibility, Primary Instructor, Web, Independent Study.

ME 596-027, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-027, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2021

ME 461-001, Finite Elem Enger, UP. 3 credits, 42 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 4 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 596-027, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, COVID Remote, Independent Study.

ME 600-027, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, COVID Remote, Thesis Research.

### Spring 2021

ME 330-001, Computational Tools, UP. 3 credits, 132 Student(s), 50% responsibility, Primary Instructor, COVID Web, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Laboratory.

ME 330-003L, Computational Tools, UP. 3 credits, 29 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Laboratory.

ME 330-004L, Computational Tools, UP. 3 credits, 17 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Laboratory.

ME 330-005L, Computational Tools, UP. 3 credits, 28 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Laboratory.

ME 330-006L, Computational Tools, UP. 3 credits, 28 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Laboratory.

ME 596-026, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, COVID Mixed Mode, Independent Study.

ME 600-026, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, COVID Mixed Mode, Thesis Research.

### Fall 2020

ME 330-001, Computational Tools, UP. 3 credits, 177 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 330-001L, Computational Tools, UP. 3 credits, 29 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 330-002L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 330-003L, Computational Tools, UP. 3 credits, 31 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 330-004L, Computational Tools, UP. 3 credits, 27 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 330-005L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 330-006L, Computational Tools, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, COVID Mixed Mode, Lecture.

ME 600-027, Thesis Research, UP. Variable credits, 3 Student(s), 100% responsibility, Primary Instructor, COVID Mixed Mode, Thesis Research.

### Summer 1 2020

ME 461-001, Finite Elem Enger, UP. 3 credits, 50 Student(s), 100% responsibility, Primary Instructor, COVID Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 7 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

### Spring 2020

ME 497-004, Special Topics, UP. 3 credits, 30 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 14 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture. (Cross-listed with ME 563.)

ME 563-001, Nonlin Finite Elem, WC. 3 credits, 7 Student(s), 100% responsibility, Primary Instructor, Web, Lecture. (Cross-listed with ME 563.)

ME 596-026, Individual Studies, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-026, Thesis Research, UP. Variable credits, 4 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Fall 2019

BME 496-019, Indep Studies, UP. Variable credits, 1 Student(s), 0% responsibility, Primary Instructor, In Person, Independent Study.

ME 461-001, Finite Elem Enger, WC. 3 credits, 18 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 497-004, Special Topics, UP. 3 credits, 28 Student(s), 50% responsibility, Primary Instructor, In Person, Lecture.

ME 596-027, Individual Studies, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-027, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2019

ME 461-001, Finite Elem Enger, UP. 3 credits, 20 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 27 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 596-005, Individual Studies, WC. 3 credits, 1 Student(s), 100% responsibility, Primary Instructor, Web, Independent Study.

### Spring 2019

BME 496-018, Indep Studies, UP. Variable credits, 2 Student(s), 0% responsibility, Primary Instructor, In Person, Independent Study.

ME 496-016, Indep Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 7 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture.

ME 563-001, Nonlin Finite Elem, WC. 3 credits, 14 Student(s), 100% responsibility, Primary Instructor, Web, Lecture.

ME 596-026, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-026, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, Primary Instructor, In Person, Thesis Research.

### Fall 2018

ME 461-001, Finite Elem Enger, WC. 3 credits, 22 Student(s), 100% responsibility, Primary Instructor, Web, Lecture. (Cross-listed with ME 461.)

ME 461-002, Finite Elem Enger, UP. 3 credits, 80 Student(s), 100% responsibility, Primary Instructor, In Person, Lecture. (Cross-listed with ME 461.)

ME 497-004, Special Topics, UP. 3 credits, 6 Student(s), 50% responsibility, Primary Instructor, Web, Lecture.

ME 596-022, Individual Studies, UP. Variable credits, 1 Student(s), 0% responsibility, Primary Instructor, In Person, Independent Study.

ME 600-022, Thesis Research, UP. Variable credits, 1 Student(s), 0% responsibility, Primary Instructor, In Person, Thesis Research.

### Summer 1 2018

ME 461-001, Finite Elem Enger, UP. 3 credits, 13 Student(s), 100% responsibility, Primary Instructor, Web, Lecture. (Cross-listed with ME 461.)

ME 461-001, Finite Elem Enger, WC. 3 credits, 20 Student(s), 100% responsibility, Primary Instructor, Web, Lecture. (Cross-listed with ME 461.)

ME 600-022, Thesis Research, UP. Variable credits, 1 Student(s), 0% responsibility, Primary Instructor, In Person, Thesis Research.

ME 610-006, Thes Res Off Cmpus, UP. Variable credits, 1 Student(s), 0% responsibility, Primary Instructor, In Person, Thesis Research.

### Spring 2018

ME 494H-016, Senior Thesis, UP. Variable credits, 1 Student(s), 100% responsibility, In Person, Research.

ME 496-016, Indep Studies, UP. Variable credits, 1 Student(s), 100% responsibility, In Person, Independent Study.

ME 497-003, Special Topics, UP. 3 credits, 26 Student(s), 50% responsibility, In Person, Lecture.

ME 497-004, Special Topics, UP. 3 credits, 27 Student(s), 50% responsibility, In Person, Lecture.

ME 563-001, Nonlin Finite Elem, WC. 3 credits, 9 Student(s), 100% responsibility, Web, Lecture.

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 8 Student(s), 100% responsibility, In Person, Lecture.

ME 596-022, Individual Studies, UP. Variable credits, 1 Student(s), 100% responsibility, In Person, Independent Study.

ME 600-022, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, In Person, Thesis Research.

### Fall 2017

ME 461-001, Finite Elem Enger, WC. 3 credits, 6 Student(s), 100% responsibility, Web, Lecture.

ME 461-002, Finite Elem Enger, UP. 3 credits, 39 Student(s), 100% responsibility, In Person, Lecture.

ME 461-004, Finite Elem Enger, UP. 3 credits, 2 Student(s), 100% responsibility, Web, Lecture.

ME 494H-016, Senior Thesis, UP. Variable credits, 2 Student(s), 100% responsibility, In Person, Research.

ME 600-016, Thesis Research, UP. Variable credits, 2 Student(s), 100% responsibility, In Person, Thesis Research.

### Summer 1 2017

ME 461-001, Finite Elem Enger, UP. 3 credits, 6 Student(s), 100% responsibility, Web, Lecture.

ME 461-001, Finite Elem Enger, WC. 3 credits, 24 Student(s), 100% responsibility, Web, Lecture.

ME 596-004, Individual Studies, WC. 3 credits, 1 Student(s), 100% responsibility, Web, Independent Study.

### Spring 2017

ME 494H-017, Senior Thesis, UP. Variable credits, 1 Student(s), 100% responsibility, In Person, Research.

ME 496-016, Indep Studies, UP. Variable credits, 3 Student(s), 100% responsibility, In Person, Independent Study.

ME 563-001, Nonlin Finite Elem, UP. 3 credits, 14 Student(s), 100% responsibility, In Person, Lecture.

ME 596-016, Individual Studies, UP. Variable credits, 5 Student(s), 100% responsibility, In Person, Independent Study.

### Fall 2016

ME 440-005, Mech Sys Design, UP. 3 credits, 14 Student(s), 100% responsibility, Resident Instruction.

ME 494-016, Research Project, UP. Variable credits, 1 Student(s), 100% responsibility, Resident Instruction.

ME 496-016, Indep Studies, UP. Variable credits, 3 Student(s), 100% responsibility, Resident Instruction.

ME 596-017, Individual Studies, UP. Variable credits, 6 Student(s), 100% responsibility, Resident Instruction.

### Summer 1 2016

M E 600-018, Thesis Research, UP. 1 credits, 2 Student(s), 100% responsibility, Resident Instruction.

M E 610-001, Thesis Research Off Campus, UP. 1 credits, 6 Student(s), 100% responsibility, Resident Instruction.

### Spring 2016

M E 461-001, Finite Elements in Engineering, UP. 3 credits, 32 Student(s), 100% responsibility, Resident Instruction.

M E 494H-016, Senior Thesis, UP. 1 credits, 1 Student(s), 100% responsibility, Resident Instruction.

M E 563-001, Nonlinear Finite Elements, UP. 3 credits, 14 Student(s), 100% responsibility, Resident Instruction.

M E 596-017, Individual Studies, UP. 1 credits, 6 Student(s), 100% responsibility, Resident Instruction.

M E 600-017, Thesis Research, UP. Variable credits, 1 Student(s), 100% responsibility, Resident Instruction.

### Fall 2015

M E 461-002, Finite Elements in Engineering, UP. 3 credits, 35 Student(s), 100% responsibility, Resident Instruction.

M E 494H-014, Senior Thesis, UP. 2 credits, 1 Student(s), 100% responsibility, Resident Instruction.

M E 596-013, Individual Studies, UP. 4 credits, 3 Student(s), 100% responsibility, Resident Instruction.

M E 600-013, Thesis Research, UP. 6 credits, 1 Student(s), 100% responsibility, Resident Instruction.

### Spring 2015

M E 494H-014, Senior Thesis, UP. 4 credits, 2 Student(s), 100% responsibility, Resident Instruction.

M E 496-014, Independent Studies, UP. 2 credits, 2 Student(s), 100% responsibility, Resident Instruction.

M E 563-001, Nonlinear Finite Elements, UP. 3 credits, 13 Student(s), 100% responsibility, Resident Instruction.

M E 596-014, Individual Studies, UP. 6 credits, 2 Student(s), 100% responsibility, Resident Instruction.

M E 600-014, Thesis Research, UP. 3 credits, 1 Student(s), 100% responsibility, Resident Instruction.

ME 461-001, Finite Elem Enger, UP. 3 credits, 37 Student(s), 100% responsibility, In Person, Lecture.

### Fall 2014

M E 360-002, Mechanical Design, UP. 3 credits, 94 Student(s), 100% responsibility, Resident Instruction.

M E 496-011, Independent Studies, UP. 3 credits, 1 Student(s), 100% responsibility, Resident Instruction.

M E 596-016, Individual Studies, UP. 4.5 credits, 2 Student(s), 100% responsibility, Resident Instruction.

### Spring 2014

M E 496-018, Independent Studies, UP. 2 credits, 2 Student(s), 100% responsibility, Resident Instruction.

M E 496-024, Independent Studies, UP. 3 credits, 1 Student(s), 100% responsibility, Resident Instruction.

M E 563-001, Nonlinear Finite Elements, UP. 3 credits, 9 Student(s), 100% responsibility, Resident Instruction.

### Fall 2013

M E 360-002, Mechanical Design, UP. 3 credits, 83 Student(s), 100% responsibility, Resident Instruction.

M E 496-047, Independent Studies, UP. 1.7 credits, 3 Student(s), 100% responsibility, Resident Instruction.

**Concise Compilation of Results of Student Feedback from Multiple Sources, Documented Evaluation of Candidate’s Programs, Activities, and Skills in Relating to Clientele**

Student SEEQ Feedback

**Summer 1 2024**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 596-001**, WC, 1, 0% responded. Instruction Mode: Remote Asynchronous | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. |  |  |  |  |  | multi-modal |  |
| A3-The instructor created a welcoming and inclusive environment. |  |  |  |  |  | multi-modal |  |

**Spring 2024**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330-001**, UP, 168, 67.3% responded. Instruction Mode: Remote Asynchronous | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 4 (4%) | 4 (4%) | 44 (39%) | 60 (54%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 1 (1%) | 12 (11%) | 30 (27%) | 69 (62%) | 5 | 5 |
| **ME 330-001L**, UP, 45, 20% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 1 (11%) | 0 (0%) | 2 (22%) | 3 (33%) | 3 (33%) | multi-modal | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 1 (11%) | 1 (11%) | 4 (44%) | 3 (33%) | 4 | 4 |
| **ME 330-002L**, UP, 40, 20% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 0 (0%) | 5 (63%) | 3 (38%) | 4 | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 2 (25%) | 2 (25%) | 2 (25%) | 2 (25%) | multi-modal | 3.5 |
| **ME 330-003L**, UP, 44, 9.1% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 0 (0%) | 1 (25%) | 3 (75%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 0 (0%) | 1 (25%) | 3 (75%) | 5 | 5 |
| **ME 330-004L**, UP, 39, 17.9% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 0 (0%) | 3 (43%) | 4 (57%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 1 (14%) | 1 (14%) | 5 (71%) | 5 | 5 |
| **ME 563-001**, UP, 14, 35.7% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 0 (0%) | 2 (40%) | 3 (60%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 5 (100%) | 5 | 5 |
| **ME 563-001**, WC, 20, 30% responded. Instruction Mode: Remote Asynchronous | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 1 (17%) | 4 (67%) | 1 (17%) | 4 | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 1 (17%) | 2 (33%) | 3 (50%) | 5 | 4.5 |
| **ME 596-002**, WC, 1, 0% responded. Instruction Mode: Remote Asynchronous | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. |  |  |  |  |  | multi-modal |  |
| A3-The instructor created a welcoming and inclusive environment. |  |  |  |  |  | multi-modal |  |

**Fall 2023**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330-001**, UP, 201, 55.2% responded. Instruction Mode: Remote Asynchronous | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 1 (1%) | 3 (3%) | 5 (5%) | 47 (42%) | 55 (50%) | 5 | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 1 (1%) | 9 (8%) | 31 (28%) | 70 (63%) | 5 | 5 |
| **ME 330-001L**, UP, 53, 66% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 2 (6%) | 16 (46%) | 17 (49%) | 5 | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 3 (9%) | 10 (29%) | 22 (63%) | 5 | 5 |
| **ME 330-002L**, UP, 49, 46.9% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 0 (0%) | 1 (4%) | 10 (43%) | 12 (52%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 2 (9%) | 3 (13%) | 18 (78%) | 5 | 5 |
| **ME 330-003L**, UP, 55, 52.7% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 0 (0%) | 1 (3%) | 2 (7%) | 11 (38%) | 15 (52%) | 5 | 5 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 4 (14%) | 7 (24%) | 18 (62%) | 5 | 5 |
| **ME 330-004L**, UP, 44, 63.6% responded. Instruction Mode: In Person | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | Mode | Median |
| A2-The overall structure of the course (content and materials, assignments, activities) promoted a meaningful learning experience for me. | 1 (4%) | 3 (11%) | 3 (11%) | 13 (46%) | 8 (29%) | 4 | 4 |
| A3-The instructor created a welcoming and inclusive environment. | 0 (0%) | 0 (0%) | 2 (7%) | 12 (43%) | 14 (50%) | 5 | 4.5 |

Student SRTE Feedback

**Summer 1 2023**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 360 - 001**, UP, 34, 79.4% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (3%) | 3 (11%) | 23 (85%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 3 (11%) | 24 (88%) | 7 | 7 |
| **ME 461 - 001**, UP, 29, 72.4% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 6 (28%) | 15 (71%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 4 (19%) | 17 (80%) | 7 | 7 |
| **ME 461 - 001**, WC, 15, 100% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 2 (13%) | 2 (13%) | 11 (73%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 2 (13%) | 0 (0%) | 13 (86%) | 7 | 7 |

**Spring 2023**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330 - 001**, UP, 151, 86.1% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 1 (0%) | 0 (0%) | 3 (2%) | 4 (3%) | 9 (6%) | 33 (25%) | 80 (61%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 2 (1%) | 1 (0%) | 5 (3%) | 6 (4%) | 7 (5%) | 38 (29%) | 70 (54%) | 7 | 7 |

**Fall 2022**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330 - 001**, UP, 233, 42.1% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 3 (3%) | 4 (4%) | 5 (5%) | 16 (16%) | 22 (22%) | 27 (27%) | 21 (21%) | 6 | 5 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 5 (5%) | 8 (8%) | 11 (11%) | 18 (18%) | 20 (20%) | 17 (17%) | 19 (19%) | 5 | 5 |
| **ME 600 - 027**, UP, 3, 33.3% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |

**Summer 1 2022**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 360 - 001**, UP, 39, 82.1% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 9 (28%) | 23 (71%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 6 (18%) | 26 (81%) | 7 | 7 |
| **ME 461 - 001**, UP, 39, 74.4% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 5 (17%) | 23 (82%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (3%) | 28 (96%) | 7 | 7 |
| **ME 461 - 001**, WC, 16, 93.8% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (6%) | 2 (13%) | 12 (80%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 1 (6%) | 0 (0%) | 1 (6%) | 13 (86%) | 7 | 7 |
| **ME 596 - 008**, WC, 1, 100% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |

**Spring 2022**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 494 H - 016**, UP, 2, 100% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (50%) | 0 (0%) | 1 (50%) | multi-modal | 6 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (50%) | 1 (50%) | multi-modal | 6.5 |
| **ME 563 - 001**, WC, 9, 77.8% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 2 (28%) | 5 (71%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 7 (100%) | 7 | 7 |
| **ME 563 - 001**, UP, 11, 90.9% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (10%) | 6 (60%) | 3 (30%) | 6 | 6 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 5 (50%) | 5 (50%) | multi-modal | 6.5 |

**Fall 2021**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330 - 001**, UP, 219, 82.2% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 4 (2%) | 9 (5%) | 55 (30%) | 112 (62%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 1 (0%) | 0 (0%) | 4 (2%) | 10 (5%) | 42 (23%) | 121 (67%) | 7 | 7 |
| **ME 494 H - 022**, UP, 2, 50% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 0 (0%) | 6 | 6 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 0 (0%) | 6 | 6 |
| **ME 596 - 003**, WC, 1, 100% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (100%) | 7 | 7 |

**Summer 1 2021**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 461 - 001**, UP, 39, 5.1% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 2 (100%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (50%) | 0 (0%) | 1 (50%) | multi-modal | 6 |
| **ME 461 - 001**, WC, 4, 75% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics. | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 1 (33%) | 0 (0%) | 2 (66%) | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you. | 0 (0%) | 0 (0%) | 0 (0%) | 1 (33%) | 0 (0%) | 0 (0%) | 2 (66%) | 7 | 7 |

**Spring 2021**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ME 330 - 001**, UP, 129, 94.6% responded | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Mode | Median |
| Rate how well this course increased your understanding of the course topics |  |  |  |  |  |  |  | 7 | 7 |
| Rate how well the instructor promoted a meaningful learning experience for you |  |  |  |  |  |  |  | 7 | 7 |

**Fall 2019**

|  |  |
| --- | --- |
| **ME 461 - 001**, WC, 18, 94.4% responded | Mean |
| Mean Rating for Overall Course Quality | 6.65 |
| Mean Rating for Overall Instructor Quality | 6.76 |
| **ME 497 - 004**, UP, 28, 32.1% responded | Mean |
| Mean Rating for Overall Course Quality | 5.56 |
| Mean Rating for Overall Instructor Quality | 6.33 |
| **ME 596 - 027**, UP, 2, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **ME 600 - 027**, UP, 2, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Summer 1 2019**

|  |  |
| --- | --- |
| **ME 461 - 001**, WC, 27, 29.6% responded | Mean |
| Mean Rating for Overall Course Quality | 6.25 |
| Mean Rating for Overall Instructor Quality | 6.25 |
| **ME 461 - 001**, UP, 20, 20% responded | Mean |
| Mean Rating for Overall Course Quality | 6.25 |
| Mean Rating for Overall Instructor Quality | 6.5 |
| **ME 596 - 005**, WC, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Spring 2019**

|  |  |
| --- | --- |
| **ME 563 - 001**, UP, 7, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 5 |
| Mean Rating for Overall Instructor Quality | 4.86 |
| **ME 563 - 001**, WC, 14, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6.14 |
| Mean Rating for Overall Instructor Quality | 6.43 |
| **ME 600 - 026**, UP, 2, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Fall 2018**

|  |  |
| --- | --- |
| **ME 461 - 001**, WC, 22, 77.3% responded | Mean |
| Mean Rating for Overall Course Quality | 6.71 |
| Mean Rating for Overall Instructor Quality | 6.88 |
| **ME 461 - 002**, UP, 80, 88.8% responded | Mean |
| Mean Rating for Overall Course Quality | 6.31 |
| Mean Rating for Overall Instructor Quality | 6.51 |
| **ME 497 - 004**, UP, 6, 16.7% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **ME 600 - 022**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Summer 1 2018**

|  |  |
| --- | --- |
| **ME 461 - 001**, WC, 20, 70% responded | Mean |
| Mean Rating for Overall Course Quality | 6.36 |
| Mean Rating for Overall Instructor Quality | 6.57 |
| **ME 461 - 001**, UP, 13, 76.9% responded | Mean |
| Mean Rating for Overall Course Quality | 6.56 |
| Mean Rating for Overall Instructor Quality | 6.89 |
| **ME 600 - 022**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Spring 2018**

|  |  |
| --- | --- |
| **ME 497 - 003**, UP, 26, 80.8% responded | Mean |
| Mean Rating for Overall Course Quality | 6.62 |
| Mean Rating for Overall Instructor Quality | 6.86 |
| **ME 497 - 004**, UP, 27, 85.2% responded | Mean |
| Mean Rating for Overall Course Quality | 6.26 |
| Mean Rating for Overall Instructor Quality | 6.61 |
| **ME 563 - 001**, UP, 8, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6 |
| Mean Rating for Overall Instructor Quality | 6.38 |
| **ME 563 - 001**, WC, 9, 88.9% responded | Mean |
| Mean Rating for Overall Course Quality | 6.25 |
| Mean Rating for Overall Instructor Quality | 6.5 |
| **ME 596 - 022**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **ME 600 - 022**, UP, 2, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 6 |

**Fall 2017**

|  |  |
| --- | --- |
| **ME 461 - 001**, WC, 6, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6.6 |
| Mean Rating for Overall Instructor Quality | 6.5 |
| **ME 461 - 002**, UP, 39, 92.3% responded | Mean |
| Mean Rating for Overall Course Quality | 6.75 |
| Mean Rating for Overall Instructor Quality | 6.92 |
| **ME 494 H - 016**, UP, 2, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6.5 |
| Mean Rating for Overall Instructor Quality | 7 |
| **ME 600 - 016**, UP, 2, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Summer 1 2017**

|  |  |
| --- | --- |
| **ME 461 - 001**, UP, 7, 14.3% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 6 |
| **ME 461 - 001**, WC, 24, 33.3% responded | Mean |
| Mean Rating for Overall Course Quality | 6.38 |
| Mean Rating for Overall Instructor Quality | 6.5 |

**Spring 2017**

|  |  |
| --- | --- |
| **ME 461 - 001**, UP, 37, 97.3% responded | Mean |
| Mean Rating for Overall Course Quality | 6.39 |
| Mean Rating for Overall Instructor Quality | 6.5 |
| **ME 563 - 001**, UP, 14, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6.21 |
| Mean Rating for Overall Instructor Quality | 6.46 |
| **ME 596 - 016**, UP, 5, 20% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Fall 2016**

|  |  |
| --- | --- |
| **ME 440 - 005**, UP, 14, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 6 |
| Mean Rating for Overall Instructor Quality | 6.57 |
| **ME 596 - 017**, UP, 6, 33.3% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Spring 2016**

|  |  |
| --- | --- |
| **M E 461 - 001**, UP, 30, 86.7% responded | Mean |
| Mean Rating for Overall Course Quality | 6.38 |
| Mean Rating for Overall Instructor Quality | 6.36 |
| **M E 494 H - 016**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 563 - 001**, UP, 13, 92.3% responded | Mean |
| Mean Rating for Overall Course Quality | 6.67 |
| Mean Rating for Overall Instructor Quality | 6.67 |
| **M E 596 - 017**, UP, 6, 83.3% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Fall 2015**

|  |  |
| --- | --- |
| **M E 461 - 002**, UP, 35, 97.1% responded | Mean |
| Mean Rating for Overall Course Quality | 4.44 |
| Mean Rating for Overall Instructor Quality | 4.53 |
| **M E 596 - 013**, UP, 3, 33.3% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 600 - 013**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 4 |
| Mean Rating for Overall Instructor Quality | 1 |

**Spring 2015**

|  |  |
| --- | --- |
| **M E 494 H - 014**, UP, 2, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 496 - 014**, UP, 2, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 563 - 001**, UP, 12, 58.3% responded | Mean |
| Mean Rating for Overall Course Quality | 5 |
| Mean Rating for Overall Instructor Quality | 4.86 |
| **M E 596 - 014**, UP, 2, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Fall 2014**

|  |  |
| --- | --- |
| **M E 360 - 002**, UP, 91, 89% responded | Mean |
| Mean Rating for Overall Course Quality | 5.07 |
| Mean Rating for Overall Instructor Quality | 5.28 |
| **M E 496 - 011**, UP, 1, 100% responded | Mean |
| Mean Rating for Overall Course Quality | 6 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 596 - 016**, UP, 2, 0% responded | Mean |
| Mean Rating for Overall Course Quality |  |
| Mean Rating for Overall Instructor Quality |  |

**Spring 2014**

|  |  |
| --- | --- |
| **M E 496 - 018**, UP, 2, 50% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |
| **M E 563 - 001**, UP, 8, 75% responded | Mean |
| Mean Rating for Overall Course Quality | 5.5 |
| Mean Rating for Overall Instructor Quality | 5.5 |

**Fall 2013**

|  |  |
| --- | --- |
| **M E 360 - 002**, UP, 81, 90.1% responded | Mean |
| Mean Rating for Overall Course Quality | 5 |
| Mean Rating for Overall Instructor Quality | 5.16 |
| **M E 496 - 047**, UP, 3, 66.7% responded | Mean |
| Mean Rating for Overall Course Quality | 7 |
| Mean Rating for Overall Instructor Quality | 7 |

**Other Evidence of Resident and/or Outreach-Based Teaching and Advising Effectiveness**

## Honors or Awards for Excellence in Teaching and Advising

### Teaching

PSEAS Outstanding Teaching Award, The Penn State Engineering Alumni Society (PSEAS). (2018).

## Supervision of, and Membership on, Graduate and Undergraduate Dissertations, Theses, Projects, Monographs, Performances, Productions, and Exhibitions Required for Degrees; Types of Degrees and Years Granted

### Master's Thesis Advisor

Fournier, N., MS. Finite element modeling of gasket interfaces. (November 2023 - Present).

Lovett, J., MS. Energy based body armor design. Date Graduated: August 2023. (August 2021 - August 2023).

Norris, I., MS. Computational modeling of spinal degeneration in F35 pilots. (November 2020 - December 2022).

Dolack, M., MS. Computational morphogenesis of embryonic bone development: past, present, and future. (September 2017 - May 2019).

Gerber, J., MS. Development of a history-dependent damage model for the brain due to repetitive impacts. (November 2016 - May 2018).

Dhobale, A., MS. Assessing functional connectivity of micro-tissue engineered neural networks using calcium fluorescence imaging. (August 2016 - May 2017).

Yuchi, L., MS. A computational model of bidirectional growth for micro-Tissue Engineered Neuronal Networks (micro-TENNs). (August 2016 - May 2017).

Fang, Z., MS. MPM methods for modeling trabecular bone. (August 2016 - May 2017).

Motiwale, S., MS. Modeling intervertebral disc degeneration due to cyclic loading. (January 2015 - May 2016).

Ranslow, A., MS. Microstructural analysis of porcine skull bone subjected to impact loading. Date Graduated: May 2016. (July 2014 - May 2016).

Fielding, R., MS. Development of a lower extremity model for high strain rate impact loading. Date Graduated: May 2015. (September 2013 - May 2015).

### Master's Thesis Committee Member

Motta-Mena, J., MS. Reduced order FSI of wind turbine blades with the atmosphere. (June 2015).

Advisor: R. Campbell.

Homich, A., MS. Novel designs in needle steering. (May 2014).

Advisor: J. Moore.

Kusiak, B., MS. Design of a compliant mechanism radiofrequency ablation probe to treat pancreatic carcinoma. (April 2014).

Advisor: M. Frecker.

### Ph.D. Dissertation Advisor

Grube, R., Ph.D. High strain rate material response of Dyneema. (2023 - Present).

Pre-candidacy.

Reyes, A., Ph.D. Modeling of spinal disc degeneration in fighter jet pilots. (2022 - Present).

Post-candidacy.

Menghani, R., Ph.D. Sensor enabled, cloud-based modeling of the brain. (2017 - Present).

Post-comprehensive.  
2024 Marcus Engineering Research Fellowship.

Martin, V., Ph.D. Modeling Armor Composites Undergoing High Strain Rate Deformation. (2019 - August 2023).

Hannah, T., Ph.D. Computational and experimental characterization of high strain rate response of Dyneema. (January 2018 - July 2023).

Hertel, Z., Ph.D. An exploration of the Material Point Method (MPM) in CTH applied to soft material systems subjected to dynamic loading. (January 2015 - April 2023).

Subramani, V., Ph.D. Modeling of spinal injury under extreme loading Conditions with emphasis on military loading Scenarios – a mathematical fatigue damage model and finite element study. (November 2015 - August 2020).

Lee, C., Ph.D. A computational analysis of bone formation in the cranial vault using a reaction-diffusion-strain model. (December 2013 - May 2018).

Garimella, H., Ph.D. An embedded element based human head model to investigate axonal injury. (September 2013 - June 2017).

### Ph.D. Dissertation Committee Member

Yue, C. Relationships between the composition-structure-property in bone, at multiple length scales using integrated experiments. (October 2024 - Present).

Advisor: D. Cortes

Tugba, H. A novel treatment for facet joint pain using radiofrequency ablation. (July 2021 - October 2022).

Advisor: D. Cortes

Young, J. Steady-state response of mechanical power flow to structural modifications. (August 2021 - February 2022).

Advisor: R. Campbell

Damirchi, B. Computational investigation on carbon nanotube – composite interactions using the ReaxFF reactive force field. (March 2019 - April 2021).

Advisord: Adri Van Duin

Gauntt, S. Dynamics of hybrid gears as part of VLRCOE. (February 2019 - February 2021).

Advisor: Rob Campbell and Sean McIntyre

Patki, P. Modeling and computational of bio-degradation in engineered tissue scaffolds. (September 2017 - December 2020).

Advisor: F. Costanzo

Zhou, Y. 3D multiscale bone biomechanics study: Effect of disease and treatment. (January 2018 - November 2020).

Advisor: J. Du

Rezwan, A. Evaluation of a multi-metallic layered composite fuel cladding for improved accident tolerance using multiscale modeling and simulation. (June 2017 - December 2019).

Advisor: M. Tonks

Hudson, R., Ph.D. Computational method for modeling the vibrational properties of Nanocomposities with Embedded Carbon Nanotubes. (August 2016 - June 2018).

Advisor: A. Sinha.

Treacy, S. Stability analysis and experimental testing of fluidic pitch links in helicopters with articulated rotors. (November 2016 - July 2017).

Advisor: C. Rahn

Ma, Z. Understanding brain networks in rats and humans: Data mining in neuroimaging. (February 2017 - June 2017).

Advisor: N. Zhang

Wang, B., Ph.D. Effects of external stimuli on microstructure-property relationship at the nanoscale. (August 2014 - June 2017).

Advisor: A. Haque.

Gouge, M., Ph.D. Advancements in thermo-mechanical model development and experimental validation for direct deposition additive manufacturing processes. (December 2014 - February 2016).

Advisor: P. Michaleris.

Denlinger, E., Ph.D. Thermo-mechanical model development and experimental validation for metallic parts in additive manufacturing. (October 2014 - June 2015).

Advisor: P. Michaleris.

### Postdoctoral Mentorship Advisor

Marinov, T. Computational neuroscience: simulation of micro-tissue engineered neural networks. (September 2016 - July 2018).

### Research Activity Advisor

Caponi, L., Undergraduate. Imaging and modeling associated with split-hopkinson pressure bar testing. (June 2018 - August 2018).

Toshiba Westinghouse Summer Fellowship Program.

McDonough, B., Undergraduate. Investigation of shear thickening fluids for personal armor. (December 2015 - May 2016).

College of Engineering Research Initiative (CERI)

Kozuch, C., Undergraduate. Modeling dynamic fracture in bones. (September 2013 - May 2016).

Catherman, B., Undergraduate. Developing a miniaturized Kolsky bar for high strain rate mechanical testing of soft tissues. (May 2014 - December 2015).

Shannon, R., Undergraduate. Developing algorithms for creating statistical material properties meshes for bone. (January 2014 - December 2015).

Ho, C., Undergraduate. Scalable, fast algorithms for wireless biomechanical sensors. (January 2015 - May 2015).

Zhang, Y., Undergraduate. Finite element simulations of intervertebral discs. (August 2014 - December 2014).

Lukens, P., Undergraduate. Measuring head and neck biomechanics in sports. (June 2014 - December 2014).

de Oliveira Pereira, D., Undergraduate. Novel designs of combat boots. (May 2014 - December 2014).

Exchange Student from Brazil.

Yuan, H., Undergraduate. From pictures to parallel computing: Making an anatomic finite element model. (September 2013 - August 2014).

2014 Penn State College of Engineering Research Experience for Undergraduates Fellowship.

Roudabush, E., Undergraduate. Exploring the computer science of finite elements. (September 2013 - May 2014).

Putnam, H., Undergraduate. 3D printing a calcaneus and anatomic measurements. (September 2013 - May 2014).

McGoldrick, M., Undergraduate. Exploring intersections of biology and engineering. (September 2013 - May 2014).

### Undergraduate Honors Thesis Advisor

Brown, B., Undergraduate. Advanced visualization techniques for brain modeling. (January 2021 - May 2022).

Schreyer's Honors College.

Mackay, J., Undergraduate. Brain impact analysis from overpressure sources through machine learning based on explosion simulations and wearable blast gauges. (January 2021 - May 2022).

Schreyer's Honors College.

Aklilu, O., Undergraduate. Experimental and computational investigation of correlates of diffusion tensor imaging changes and mechanical strain. Date Graduated: May 2021. (August 2018 - May 2021).

Millennium Scholars Program and Schreyer Honors Student.

Katch, L., Undergraduate. Reverse source localization for identification of overpressure sources based on wearable blast gauges. (August 2019 - April 2020).

Casey, P., Undergraduate. Behavior of a modeled hip implant insertion device through finite element analysis. (November 2017 - May 2018).

Schreyer's Honor College.

De Tomas-Medina, P., Undergraduate. Modeling the response of neurons subjected to high rate deformation: Comparing simulations to experimental results. (January 2015 - May 2018).

Millennium Scholars Program.  
Schreyer's Honor College.

Borusiewicz, M., Undergraduate. Quantifying the structure of micro-tissue engineered neural networks. (August 2016 - May 2017).

Schreyer's Honor College.

Sodha, K., Undergraduate. Estimating dynamic properties for biological materials: Design, development, and calibration of a desktop miniaturized double-lap shear Kolsky bar. Date Graduated: May 2016. (September 2014 - May 2016).

Schreyer's Honors College.

Robinson, M., Undergraduate. The development of an anatomically correct model of calcaneus fracture and fragmentation due to impact loading. Date Graduated: May 2015. (September 2013 - May 2015).

Schreyer's Honors College.



# THE SCHOLARSHIP OF Research and

# Creative Accomplishments

This section contains the following, listed in standard bibliographic form with the most recent date first. (Do not include material contained in other sections of the dossier.) The list below is intentionally comprehensive and inclusive of all disciplines. Candidates are not expected to have an entry for every category.

• Research and/or scholarly publications

Citations should include beginning and ending page numbers or total number of pages, where appropriate; for multiple-authored works, the contribution of the candidate should be clearly indicated (e.g., co-author, supervised person who authored the work, etc. and percent of contribution).    Electronic journals should be listed in appropriate categories with documentation as outlined in the Administrative Guidelines, III.C.7.

Publications should be listed as follows:

    1. Articles published in refereed journals (include only articles in refereed journals in this section)

    2. Books

    3. Parts of books

    4. Book reviews

    5. Refereed conference proceedings

    6. Articles published in nonrefereed journals

    7. Articles in in-house publications

    8. Research reports to sponsor

    9. Manuscripts accepted for publication (substantiated by letter of acceptance) - Indicate if peer reviewed and number of pages of manuscript

10. Manuscripts submitted for publication, with an indication of where submitted and when - Indicate if peer reviewed and number of pages of manuscript

11. Manuscripts in progress (second-, third-, fourth-, and fifth-, and at the College of Medicine, sixth-, seventh- and eighth-year reviews only)

12. Cooperative extension bulletins and circulars

• Creative accomplishments

Exhibition, installation, production, or publication of original works of architecture, dance, design, electronic media, film, journalism, landscape architecture, literature, music, theatre, and visual art

Performance of original dance, literary, musical, visual arts, or theatrical works or works from traditional and contemporary repertories of the performing arts

• Papers, presentations, seminars, and workshops

Papers presented at technical and professional meetings (meeting and paper titles); indication about whether the candidate was the presenter

Record of participation in, and description of, seminars and workshops (short description of activity, with titles, dates, sponsor, etc.); indication of role in seminar or workshop, e.g., student, invited participant, etc.

• Description of outreach or other activities in which there was significant use of candidate’s expertise (consulting, journal editor, reviewer for refereed journals or presses, peer reviewer of grants, speaking engagements, services to government agencies, professional and industrial associations, educational institutions, etc.)

(07-01-2022)

# THE SCHOLARSHIP OF RESEARCH AND

# CREATIVE ACCOMPLISHMENTS

# (continued)

• Projects, grants, commissions, and contracts (date, title, where submitted, amount, percent credit):

1. Awarded (Fully processed financial award)

2. Pending (Submitted proposal that is awaiting funding status from sponsor)

3. Not Funded (Notification received from sponsor or principal investigator that proposal was not funded; second-, third-, fourth-, and fifth-, and at the College of Medicine, sixth-, seventh-, and eighth-year reviews only)

• List of grants and contracts for improvement of instruction, with an indication of the candidate’s role and percent credit in preparing and administering the grants and contracts

• Other evidence of research or creative accomplishments as appropriate (patents, new product development, new art forms, citation index analysis, etc.) including impact in society of research scholarship and creative accomplishments

• Record of pursuit of advanced degrees and/or further academic studies

• Record of membership in professional and learned societies

• Description of new courses and/or programs developed, including service learning and outreach courses

• Description of new computer software programs developed

• Description of new methods of teaching established courses and/or programs

• List of honors or awards for scholarship, research, or creative activities

• Applications of research scholarship in the field including new applications developed and tested; new or enhanced systems and procedures demonstrated or evaluated for government agencies, professional and industrial associations, educational institutions, etc.

• Technology transferred or adapted in the field

• Technical assistance provided

• If there are unit-specific objective criteria used for assessing the scholarly substance and quality of the candidate’s achievement in research and creative accomplishment, list the candidate’s performance as measured by these criteria.

(07-01-2022)

# THE SCHOLARSHIP OF RESEARCH AND CREATIVE ACCOMPLISHMENTS

**Research and/or Scholarly Publications**

**Published Works**

**Articles in Refereed Journals**

***Journal Article***

1. Martin, V. (Primary Author - Graduate Student), Hannah, T., Ellis, S., & Kraft, R. H. (Corresponding Author) (2023). Using the embedded element finite element method to simulate impact of Dyneema plates. *Fibers and Polymers*. DOI: 10.1007/s12221-023-00417-z

2. Hannah, T. (Student Author - Graduate Student), Kraft, R. H., Martin, V. (Co-Author - Graduate Student), & Ellis, S. Impact of imperfect Kolsky bar experiments across different scales using finite elements. *Journal of Verification, Validation and Uncertainty Quantification*.

3. Hannah, T. (Student Author - Graduate Student), Schuster, B., Baker, Z., Ellis, S., & Kraft, R. H. Miniature Kolsky Bar Experiment Techniques Applied to UHMWPE Composite Analysis. *Journal of Dynamic Behavior of Materials*.

4. Zuidema, T. R., Bazarian, J. J., Kercher, K. A., Rettke, D. J., Mannix, R., Kraft, R. H., Newman, S. D., Ejima, K., Steinfeldt, J. A., & Kawata, K. (2023). Longitudinal association of clinical and biochemical biomarkers with head impact exposure in adolescent football. *JAMA Network Open*. DOI: 10.1001/jamanetworkopen.2023.16601

5. Menghani, R. R. (Primary Author - Graduate Student), Dasans, A., & Kraft, R. H. (Corresponding Author) (2023). A sensor-enabled cloud-based computing platform for computational brain biomechanics. *Computer Methods in Biomechanics and Biomedical Engineering*. DOI: 10.1016/j.cmpb.2023.107470

6. Ramtani, S., Sánchez, J. F., Boucetta, A., Kraft, R. H., Vaca-González, J. J., & Garzón-Alvarado, D. A. (2023). A coupled mathematical model between bone remodeling and tumors: a study of different scenarios using Komarova’s model. *Biomechanics and Modeling in Mechanobiology*. DOI: 10.1007/s10237-023-01689-3

7. Ji, S., Ghajari, M., Mao, H., Kraft, R. H., Hajiaghamemar, M., Panzer, M. B., Willinger, R., Gilchrist, M. D., Kleiven, S., & Stitzel, J. D. (2022). Use of brain biomechanical models for monitoring impact exposure in contact sports. *Annals of Biomedical Engineering*. DOI: 10.1007/s10439-022-02999-w

8. Martin, V. (Primary Author - Graduate Student), Kraft, R. H. (Corresponding Author), Hannah, T. (Co-Author - Graduate Student), & Ellis, S. (2022). An energy-based study of the embedded element method for explicit dynamics. *Advanced Modeling and Simulation in Engineering Sciences*. DOI: 10.1186/s40323-022-00223-x

9. Adewole, D. O., Struzyna, L. A., Harris, J. P., Nemes, A. D., Burrell, J. C., Petrov, D., Kraft, R. H., Chen, I., Serruya, M. D., Wolf, J. A., & Cullen, K. (2021). Development of optically controlled “living electrodes” with long-projecting axon tracts for a synaptic brain-machine interface. *Science Advances 7*(4). DOI: 10.1126/sciadv.aay5347

10. Marinov, T. (Student Author - Postdoctoral Student), Yuchi, L. (Student Author - Graduate Student), Adewole, D. O., Cullen, D. Kacy, & Kraft, R. H. (2020). A computational model of bidirectional axonal growth in micro-tissue engineered neuronal networks (micro-TENNs). *In Silico Biology 13*(3-4), pp. 85-99. DOI: 10.3233/ISB-180172

11. Subramani, A. V. (Student Author - Graduate Student), Whitley, P., Garimella, H. T. (Student Author), & Kraft, R. H. (2020). Fatigue damage prediction in the annulus of cervical spine intervertebral discs using finite element analysis. *Computer Methods in Biomechanics and Biomedical Engineering 23*(11), 773-784. DOI: 10.1080/10255842.2020.1764545

12. Carrera-Pinzón, A. F., Márquez-Flórez, K., Kraft, R. H., Ramtani, S., & Garzón-Alvarado, D. A. (2019). Computational model of a synovial joint morphogenesis. *Biomechanics and Modeling in Mechanobiology*, 1--14. DOI: 10.1007/s10237-019-01277-4

13. Kraft, R. H. (Author), Lee, C. (Author - Graduate Student), Richtsmeier, J. T., & Dolack, M. E. (Author - Graduate Student) (2019). Exploring mechanisms of cranial vault development using a coupled turing-biomechanical model. *The FASEB Journal 33*, 326.2-326.2. DOI: 10.1096/fasebj.2019.33.1\_supplement.326.2

14. Lee, C. (Student Author - Graduate Student), Richtsmeier, J. T., & Kraft, R. H. (2019). A coupled reaction–diffusion–strain model predicts cranial vault formation in development and disease. *Biomechanics and Modeling in Mechanobiology*. DOI: 10.1007/s10237-019-01139-z

15. Przekwas, A. J., Tan, X. Gary, Chen, Z. J., Miao, Y., Harrand, V., Garimella, H. T. (Student Author - Graduate Student), Kraft, R. H., & Gupta, R. K. (2019). Biomechanics of blast TBI with time resolved consecutive primary, secondary and tertiary loads. *Military Medicine*. DOI: 10.1093/milmed/usy344

16. Garimella, H. T. (Student Author - Graduate Student), Menghani, R. (Student Author - Graduate Student), Gerber, J. I. (Student Author - Graduate Student), Sridhar, S. (Student Author - Graduate Student), & Kraft, R. H. (2018). Embedded finite elements for modeling axonal injury. *Annals of Biomedical Engineering*. DOI: 10.1007/s10439-018-02166-0

17. Motiwale, S. (Student Author - Graduate Student), Subramani, A. V. (Student Author - Graduate Student), Zhou, A., & Kraft, R. H. (2018). A non-linear multi-axial fatigue damage model for the cervical intervertebral disc annulus. *Advances in Mechanical Engineering 10*(6). DOI: 10.1177/1687814018779494

18. Dhobale, A. V. (Student Author - Graduate Student), Adewole, O., Chan, A., Marinov, T. (Student Author - Postdoctoral Student), Serruya, M., Kraft, R. H., & Cullen, D. Kacy (2018). Assessing functional connectivity across 3D tissue engineered axonal tracts using calcium fluorescence imaging. *Journal of Neural Engineering 15*(5). DOI: 10.1088/1741-2552/aac96d

19. Ranslow, A. (Student Author - Graduate Student), Fang, Z. (Student Author - Graduate Student), De Tomas, P. (Student Author - Undergraduate Student), Gunnarsson, A., Weerasooriya, T., Satapathy, S., Thompson, K. A., & Kraft, R. H. (2018). The multiaxial failure response of porcine trabecular skull bone estimated using microstructural simulations. *American Society of Mechanical Engineers (ASME) Journal of Biomechanical Engineering 140*(10). DOI: 10.1115/1.4039895

20. Garimella, H. T. (Student Author - Graduate Student), Kraft, R. H., & Przekwas, A. J. (2018). Do blast-induced skull flexures result in axonal deformation? *PLOS One 13*(3). DOI: 10.1371/journal.pone.0190881

21. Serruya, M. D., Harris, J. P., Adewole, D. O., Struzyna, L. A., Burrell, J. C., Nemes, A., Petrov, D., Kraft, R. H., Chen, H. I., Wolf, J. A., & Cullen, D. K. (2017). Engineered axonal tracts as    "living electrodes" for synaptic-based modulation of neural circuitry. *Advanced Functional Materials*, 1701183–n/a. DOI: 10.1002/adfm.201701183

22. Lee, C. X. (Student Author - Graduate Student), Richtsmeier, J. T., & Kraft, R. H. (2017). A computational analysis of bone formation in the cranial vault using a coupled reaction-diffusion-strain model. *Journal of Mechanics in Medicine and Biology 17*(4). DOI: 10.1142/S0219519417500737

23. Garimella, H. T. (Student Author - Graduate Student), & Kraft, R. H. (2017). A new computational approach for modeling diffusion tractography in the brain. *Journal of Neural Regeneration Research 12*(1). DOI: 10.4103/1673-5374.198967

24. Garimella, H. T. (Student Author - Graduate Student), & Kraft, R. H. (2016). Modeling the mechanics of axonal fiber tracts using the embedded finite element method. *International Journal for Numerical Methods in Biomedical Engineering 33*(5), 1–21. DOI: 10.1002/cnm.2796

25. Fielding, R. A. (Student Author - Graduate Student), Przekwas, A. J., Tan, X. G., & Kraft, R. H. (2015). Development of a lower extremity model for high strain rate impact loading. *International Journal of Experimental and Computational Biomechanics 3*(2), 161-186.

DOI: 10.1504/IJECB.2015.070427

26. Lee, C. X. (Student Author - Graduate Student), Richtsmeier, J. T., & Kraft, R. H. (2015). A computational analysis of bone formation in the cranial vault in the mouse. *Frontiers in Bioengineering and Biotechnology 3*(24). DOI: 10.3389/fbioe.2015.00024

27. Swab, J. J., Tice, J., Wereszczak, A. A., & Kraft, R. H. (2014). Fracture toughness of advanced structural ceramics: Applying ASTM C1421. *Journal of the American Ceramic Society*, pp. 1-9. DOI: 10.1111/jace.13293

28. Clayton, J. D., Kraft, R. H., & Leavy, R. B. (2012). Mesoscale modeling of nonlinear elasticity and fracture in ceramic polycrystals under dynamic shear and compression. *Journal of Solids and Structures 49*(18), 6. DOI: 10.1016/j.ijsolstr.2012.05.035

29. Kraft, R. H., Mckee, P. J., Dagro, A. M., & Grafton, S. T. (2012). Combining the finite element method with structural connectome-based analysis for modeling neurotrauma: Connectome neurotrauma mechanics. *PLoS Computational Biology 8*(8), e1002619. DOI: 10.1371%2Fjournal.pcbi.1002619

30. Kraft, R. H., & Molinari, J. F. (2008). A statistical investigation of the effects of grain boundary properties on transgranular fracture. *Acta Materialia 56*(17), 10. DOI: 10.1016/j.actamat.2008.05.036

31. Kraft, R. H., Molinari, J. F., Ramesh, K. T., & Warner, D. W. (2008). Computational micromechanics of dynamic compressive loading of a brittle polycrystalline material using a distribution of grain boundary properties. *The Journal of Mechanics and Physics of Solids 56*, 23. DOI: 10.1016/j.jmps.2008.03.009

**Parts of Books**

***Book Chapter***

Dolack, M. E. (Student Author - Graduate Student), Lee, C. (Student Author - Graduate Student), Ru, Y., Marghoub, A., Richtsmeier, J. T., Jabs, E. W., Moazen, M., Garzón-Alvarado, D. A., & Kraft, R. H. (Author) (2020). Computational Morphogenesis of Embryonic Bone Development: Past, Present, and Future. *Mechanobiology* (pp. 197--219). Elsevier.

Kraft, R. H. (Primary Author), Fielding, R. A. (Student Author - Graduate Student), Lister, K., Shirley, A., Marler, T., Merkle, A. C., Przekwas, A. J., Tan, X. G., & Zhou, X. (2016). Modeling skeletal injuries in military scenarios. *Mechanobiology and Mechanophysiology of Military-Related Injuries.* (19) . Springer Berlin Heidelberg. ISBN/ISSN: 10.1007/978-3-319-33012-9

Part of the series, Studies in Mechanobiology, Tissue Engineering and Biomaterials.

Clayton, J. D., & Kraft, R. H. (2011). Mesoscale modeling of dynamic failure of ceramic polycrystals. In J. J. Swab (Ed.), *Advances in Ceramic Armor VII: Ceramic Engineering and Science Proceedings.* (568) . John Wiley & Sons. Peer-reviewed/refereed. DOI: 10.1002/9781118095256.ch21

**Refereed Conference Proceedings**

Hannah, T. (Student Author - Graduate Student), Kraft, R. H., Martin, V. (Co-Author - Graduate Student), & Ellis, S. (2023). Impact of imperfect Kolsky bar experiments across different scales using finite elements.(IMECE2022-96816) . Proceedings of the 2022 American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2022-96816

Martin, V. (Author - Graduate Student), Hannah, T. (Co-Author - Graduate Student), Ellis, S., & Kraft, R. H. (2023). Towards verification and validation of modeling Dyneema using the embedded finite element method.(IMECE2022-96784) . Proceedings of the 2022 American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2022-96784

Hannah, T. (Student Author - Graduate Student), Kraft, R. H., Martin, V. (Co-Author - Graduate Student), & Ellis, S. (2021). Implications of statistical spread to experimental analysis in a novel miniature Kolsky bar.(IMECE2020-23976) . Proceedings of the American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2020-23976

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Fang, Z. (Student Author - Graduate Student), Ranslow, A. N. (Student Author - Graduate Student), & Kraft, R. H. (2016). Computational micromechanics of trabecular porcine skull bone using the material point method. Volume 3: Biomedical and Biotechnology Engineering(IMECE2016-67748), (pp. V003T04A044; 9 pages). Proceedings of the American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2016-67748

Phoenix, Arizona, USA, November 11–17, 2016

Motiwale, S. (Student Author - Graduate Student), Subramani, V. V. (Student Author - Graduate Student), Zhou, X., & Kraft, R. H. (2016). Damage prediction for a cervical spine intervertebral disc. Volume 3: Biomedical and Biotechnology Engineering . Proceedings of the 2016 American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2016-67711

Phoenix, Arizona, USA, November 11–17, 2016

Chan, A. H. W., Dhobale, A. (Student Author - Graduate Student), Adewole, O., Marinov, T. (Student Author - Postdoctoral Student), Kraft, R. H. (Author), Cullen, D. K., & Serruya, M. (2016). Analysis of spontaneous calcium signals to infer functional connectivity within a novel “living electrode” neural construct. (pp. 1–2). Proceedings of IEEE. DOI: 10.1109/SPMB.2016.7846870

Philadelphia, PA, USA, December 3, 2016.

Ranslow, A. N. (Student Author - Graduate Student), Kraft, R. H., Shannon, R. (Student Author - Undergraduate Student), De Tomas-Medina, P. (Student Author - Undergraduate Student), Radovitsky, R., Jean, A., Hautefeuille, M. P., Fagan, B., Ziegler, K. A., Weerasooriya, T., Dileonardi, A. M., Gunnarsson, A., & Satapathy, S. (2016). Microstructural analysis of porcine skull bone subjected to impact loading. Volume 3: Biomedical and Biotechnology Engineering(IMECE2015-51979), (pp. V003T03A057; 10 pages). Proceedings of the American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2015-51979

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Lee, C. (Student Author), & Kraft, R. H. (2016). A coupled reaction-diffusion-strain model for bone growth in the cranial vault. Proceedings of the 2016 Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C2016).

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Motiwale, S. (Student Author - Graduate Student), Eppler, W., Hollingsworth, D., Hollingsworth, C., Morgenthau, J., & Kraft, R. H. (2016). Application of neural networks for filtering non-impact transients recorded from biomechanical sensors. *Proceedings of the Institute of Electrical and Electronic Engineers (IEEE) International Conference on Biomedical and Health Informatics.* (pp. 204 - 207). IEEE. DOI: 10.1109/BHI.2016.7455870

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Makwana, A. R. (Student Author - Graduate Student), Krishna, A. R. (Student Author - Graduate Student), Yuan, H. (Student Author - Undergraduate Student), Kraft, R. H., Zhou, X., Przekwas, A. J., & Whitley, P. (2014). Towards a micromechanical model of intervertebral disc degeneration under cyclic loading.(IMECE2014-39174), (pp. V003T03A012; 7 pages). Proceedings of the American Society of Mechanical Engineers Congress and Exposition. DOI: 10.1115/IMECE2014-39174

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Fielding, R. A. (Student Author - Graduate Student), Kraft, R. H., Ryan, T. M., & Stecko, T. D. (2014). A micromechanics-based simulation of calcaneus fracture and fragmentation due to impact loading. Proceedings of the 11th World Congress on Computational Mechanics (WCCM XI) 5th. European Conference on Computational Mechanics (ECCM V)    6th. European Conference on Computational Fluid Dynamics (ECFD VI).

Zhang, J., Merkle, A. C., Carneal, C. M., Armiger, R. S., Kraft, R. H., Ward, E. E., Ott, K. A., Wickwire, A. C., Dooley, C. J., Harrigan, T. P., & Roberts, J. C. (2013). Effects of torso-borne mass and loading severity on early response of the lumbar spine under high-rate vertical loading. International Research Council on Biomechanics of Injury.

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Kraft, R. H., Dagro, A. M., McKee, P. J., Grafton, S. T., Vettel, J., McDowell, K., Vindiola, M., & Merkle, A. C. (2013). Combining the finite element method with structural network-based analysis for modeling neurotrauma. (pp. 4). 11th International Symposium, Computer Methods in Biomechanics and Biomedical Engineering.

Scheidler, M., Fitzpatrick, J., & Kraft, R. H. (2011). In Tom Proulx (Ed.), Optimal pulse shapes for SHPB tests on soft materials. 1, (pp. 259-268). Society for Experimental Mechanics Series, Dynamic Behavior of Materials. DOI: 10.1007/978-1-4614-0216-9\_37, ISBN/ISSN: 2191-5644

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Kraft, R. H., Lynch, M. L., & Vogel, E. W. (2011). Computational failure modeling of lower extremities. RTO-MP-HFM-207AC/323(HFM-207)(TP/412) . NATO Human Factors and Medicine Panel. ISBN/ISSN: 978-92-837-0153-8

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Gazonas, G. A., McCauley, J. W., Kraft, R. H., Love, B. M., Clayton, J. D., Casem, D., Dandekar, D., Rice, B., Batyrev, I., Weingarten, N. S., & Schuster, B. E. (2010). Multiscale modeling of armor ceramics: Focus on AlON. 27th Army Science Conference.

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Kraft, R. H., Batyrev, I., Lee, S., Rollett, A. D., & Rice, B. (2010). In J. J. Swab, S. Mathur and T. Ohji (Eds.), "Multiscale modeling of armor ceramics." *Journal of the American Ceramics Society Meeting Proceedings.* 31 . Hoboken, NJ: John Wiley & Sons, Inc.. DOI: 10.1002/9780470944004

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Wereszczak, A. A., & Kraft, R. H. (2003). In W. M. Kriven and H. T. Lin (Eds.), Flexural and torsional resonances of ceramic tiles via impulse excitation of vibration. 24(4), (pp. 207-213). 27th Annual Conference on Advanced Ceramics and Composites: B: Ceramic Engineering and Science Proceedings. DOI: 10.1002/9780470294826.ch31

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**Other Works**

***Pre-Print***

Marinov, T. (Student Author - Postdoctoral Student), Yuchi, L. (Student Author - Graduate Student), Adewole, D. O., Cullen, D. K., & Kraft, R. H. "A computational model of bidirectional axonal growth in micro-tissue engineered neuronal networks (micro-TENNs)." *bioRxiv.* Cold Spring Harbor Laboratory. DOI: 10.1101/369843

Gerber, J. I. (Student Author), Kraft, R. H., & Garimella, H. T. (Student Author) (2018). "Computation of history-dependent mechanical damage of axonal fiber tracts in the brain: towards tracking sub-concussive and occupational damage to the brain." *bioRxiv.* DOI: 10.1101/346700

Garimella, H. T. (Student Author - Graduate Student), Menghani, R. (Student Author - Graduate Student), Gerber, J. I. (Student Author - Graduate Student), Sridhar, S. (Student Author - Graduate Student), & Kraft, R. H. (2018). "Embedded finite elements for modeling axonal injury." *engrXiv.* DOI: 10.31224/osf.io/2dx5e

Adewole, D. O., Struzyna, L. A., Harris, J. P., Nemes, A. D., Burrell, J. C., Petrov, D., Kraft, R. H., Chen, I., Serruya, M. D., Wolf, J. A., & Cullen, K. (2018). "Optically-controlled "living electrodes" with long-projecting axon tracts for a synaptic brain-machine interface." *bioRxiv.* DOI: 10.1101/333526

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Dagro, A. M., McKee, P. J., Kraft, R. H., Zhang, T. G., & Satapathy, S. S. (2013). A preliminary investigation of traumatically induced axonal injury in a three-dimensional (3-D) finite element model (FEM) of the human head during blast-loading. *Army Research Laboratory Technical Report (ARL-TR-6504).*

Vettel, J., Dagro, A. M., Gordon, S., Kerick, S., Kraft, R. H., Luo, S., Rawal, S., Vindiola, M., & McDowell, K. (2012). Brain structure-function couplings (FY11). *Army Research Laboratory Technical Report (ARL-TR-5893).*

Kraft, R. H., & Wozniak, S. L. (2011). A review of computational spinal injury biomechanics research and recommendations for future efforts. *Army Research Laboratory Technical Report (ARL-TR-5673).*

Kraft, R. H., & Dagro, A. M. (2011). Design and implementation of a numerical technique to inform anisotropic hyperelastic finite element models using diffusion-weighted imaging. *Army Research Laboratory Technical Report (ARL-TR-5796).*

Clayton, J. D., & Kraft, R. H. (2011). Mesoscale modeling of dynamic failure of ceramic polycrystals. *Army Research Laboratory Reprint (ARL-RP-328).*

Gozonas, G. A., McCauley, J. W., Batyrev, I. G., Casem, D., Clayton, J. D., Dandekar, D. P., Kraft, R. H., Love, B. M., Rice, B. M., Schuster, B. E., & Weingarten, N. S. (2011). Multiscale modeling of armor ceramics: Focus on AlON. *Army Research Laboratory Reprint (ARL-RP-337).*

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Wereszczak, A. A., Swab, J. J., & Kraft, R. H. (2005). Effects of machining on the uniaxial and equibiaxial flexure strength of CAP3 AD-995 Al2O3. *Army Research Laboratory Technical Report (ARL-TR-3617).*

Swab, J. J., Wereszczak, A. A., Tice, J., Caspe, R., Kraft, R. H., & Adams, J. (2005). Mechanical and thermal properties of advanced ceramics for gun barrel applications. *Army Research Laboratory Technical Report (ARL-TR-3417).*

**Manuscripts Submitted for Publication**

**Articles in Refereed Journals**

***Journal Article***

Subramani, A. V. (Primary Author - Graduate Student), Bhowmik, O. (Primary Author), . McKay, J. C. C., Roy, A., & Kraft, R. H. (Corresponding Author) Prediction of facial overpressure using body worn sensors and machine learning algorithms in military blast environments. *Shock Waves*. [Submitted June 2023].

**Refereed Conference Proceedings**

Huber, C. M. (Co-Author - Graduate Student), Patton, D. A., Arbogast, K. B., & Kraft, R. H. Brain tissue strain during adolescent soccer heading using the cloud-based brain simulation research platform finite element head model. Proceedings of the 2024 International Research Council on Biomechanics on Injury. [Submitted April 2024].

Leung, S. L., Ramos-Alvarado, B., Byron, M., Berdanier, C., & Kraft, R. H. Creating public resources to address resistance to diversifying content in mechanical engineering: Fostering awareness and ethical considerations. 2025 ASEE Annual Conference & Exposition. [Submitted April 2024].

Menghani, R. (Co-Author - Graduate Student), Bardall, C., Tanaka, M., & Kraft, R. H. Investigating dual strain peaks in finite element brain models of sports impacts. Proceedings of the 2024 American Society of Mechanical Engineers Congress and Exposition. [Submitted March 2024].

Reyes Kadozono, A. N. (Co-Author - Graduate Student), Dewitt, T., & Kraft, R. H. Seat angle effects on disc degeneration for pilots in high-G environments. Proceedings of the 2024 American Society of Mechanical Engineers Congress and Exposition. [Submitted March 2024].

Grube, R. (Co-Author - Graduate Student), Hannah, T. W., Martin, V. A., Ellis, S., & Kraft, R. H. Verification and validation of a novel miniaturized Kolsky bar using published Polymethyl Methacrylate (PMMA) data. Proceedings of the 2024 American Society of Mechanical Engineers Congress and Exposition. [Submitted March 2024].

## Papers, Presentations, Seminars, and Workshops

### Oral Presentations

Kraft, R. H. (Author and Presenter). (April 2024). "The quest to establish finite element brain strain as a cognitive change indicator," 2024 Mach Conference, Annapolis, MD.

Kraft, R. H. (Author and Presenter), & Dasans, A. (April 2023). "A scalable platform for modeling blast injuries using sensors, cloud computing, and machine learning," 2023 Mach Conference, Annapolis, MD.

Hannah, T. (Author and Presenter - Graduate Student), Kraft, R. H., Martin, V., & Ellis, S. (November 2022). "Impact of imperfect Kolsky bar experiments across different scales using finite elements," ASME 2022 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Columbus, Ohio. International.

Menghani, R. (Co-Author - Graduate Student), Kraft, R. H. (Author and Presenter), & Dasans, A. (November 2022). "Verification and validation of a cloud-based brain computing service," ASME 2022 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Columbus, Ohio. International.

Kraft, R. H., Dye, C., & Mackay, J. C. (October 2022). "Prediction of facial overpressure using body worn sensors and machine learning algorithms in military blast environments," 2022 Society of Engineering Science Annual Technical Meeting, Society of Engineering Science, College Station, Texas.

Kraft, R. H. (September 2022). "High throughput multiscale modeling of axonal fiber bundles in the brain of civilian athletes and the military," IRCOBI Pre-conference Workshop: Wearable Technologies for the Study of Head Injury: Applications, Challenges, and Opportunities, International Research Council on Biomechanics of Injury, Porto, Portugal, Invited.

Kraft, R. H. (July 2022). "Prediction of facial overpressure using body worn sensors and machine learning algorithms in military blast environments," 11th European Solid Mechanics Conference (ESMC2022), Galway, Ireland.

Invited Keynote

Kraft, R. H. (Author). (April 2022). "Metaverse Mechanics: How the metaverse will save mechanics, and how mechanics will save the metaverse.," 2022 Mach Conference, Hopkins Extreme Materials Institute, Virtual, Invited.

Invited Keynote

Menghani, R. (Co-Author - Graduate Student), Kraft, R. H. (Author and Presenter), Dasans, A., Rawat, M., & Bartsch, A. (November 2021). "Cost and scalability analysis of a cloud-based brain computing service," ASME 2021 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Virtual. International.

Hannah, T. (Author and Presenter - Graduate Student), Kraft, R. H. (Author and Presenter), Martin, V. (Co-Author - Graduate Student), & Ellis, S. (November 2020). "Implications of statistical spread to experimental analysis in a novel miniature kolsky bar," ASME 2020 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Virtual. International.

Kraft, R. H. (Author and Presenter), & Menghani, R. (Co-Author - Graduate Student). (November 2020). "On-demand brain simulations for prediction of cumulative head trauma," ASME 2020 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Virtual. International.

Menghani, R. (Author and Presenter - Graduate Student), & Kraft, R. H. (November 2019). "Effect of an advanced combat helmet on axonal injury caused by primary blast loading," ASME 2019 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Salt Lake City, UT. International.

Kraft, R. H. (November 2019). "Sensor-enabled cloud based computational modeling of the brain," ASME 2019 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Salt Lake City, UT. International.

Subramani, V. V. (Presenter - Graduate Student), Whitley, P. E., Garimella, H. T., & Kraft, R. H. (June 2019). "Location-wise fatigue damage prediction for the intervertebral disc annulus of the cervical spine," 2019 Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C), Seven Springs, PA.

Kraft, R. H. (June 2019). "Multiscale modeling of axonal fiber bundles in the brain," 16th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 4th Conference on Imaging and Visualization, New York City, NY, Invited.

Kraft, R. H. (June 2019). "The emergence of digital health care and what it means for experimental mechanics: a focus on the brain," Society for Experimental Mechanics, Reno, NV, Invited.

Kraft, R. H. (May 2019). "Mechanism-based brain models to study primary blast loading effects on axonal deformation: the past, present and future," 4th International Forum on Blast Injury Countermeasures (IFBIC), McLean, VA.

Kraft, R. H. (April 2019). "Exploring mechanisms of cranial vault development using a coupled Turing-biomechanical model," American Association of Anatomists (AAA) 2019 Annual Meeting, Orlando, FL.

Dolack, M. (Author and Presenter - Graduate Student), Lee, C., Richtsmeier, J. T., & Kraft, R. H. (November 2018). "A coupled reaction-diffusion-strain model of Mesenchymal stem cell differentiation into osteoblasts," ASME 2018 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Pittsburgh, PA. International.

Kraft, R. H. (Author and Presenter), & Garimella, H. T. (Author - Graduate Student). (July 2018). "Do blast-induced skull flexures result in axonal deformation?," World Congress of Biomechanics, Dublin, Ireland.

Kraft, R. H. (Author and Presenter), Garimella, H. T. (Author - Graduate Student), & Gerber, J. I. (Author). (July 2018). "Tracking damage in a digital brain," World Congress of Biomechanics, Dublin, Ireland.

Hertel, Z. R. (Author and Presenter - Graduate Student), Schumacher, S. C., & Kraft, R. H. (Author). (April 2018). "Failure models for soft materials in particle based methods," 2018 Mach Conference, Hopkins Extreme Materials Institute, Annapolis, MD.

Gerber, J. I. (Author and Presenter - Graduate Student), Garimella, T. (Author), & Kraft, R. H. (Author). (November 2017). "A computational approach to model damage in axonal fiber tracts of the brain," ASME 2017 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Tampa, FL, peer-reviewed/refereed. International.

Hertel, Z. R., Schumacher, S. C., & Kraft, R. H. (Author). (April 2017). "Development of a failure model for biological materials within the particle based software Kodiak," 2017 Mach Conference, Hopkins Extreme Materials Institute, Annapolis, MD.

Yuchi, L. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (March 2017). "Bidirectional growth model of micro-tissue engineered neuronal networks (micro-TENNs)," Keystone Connectomics Conference X2, Santa Fe, New Mexico.

Dhobale, A. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (March 2017). "Functional connectivity analysis of micro-tissue engineered neural networks," Keystone Connectomics Conference X2, Santa Fe, New Mexico.

Fang, Z. (Author and Presenter - Graduate Student), Ranslow, A. N. (Author - Graduate Student), & Kraft, R. H. (Author). (November 2016). "Computational micromechanics of trabecular porcine skull bone using the material point method," ASME 2016 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Phoenix, AZ, peer-reviewed/refereed. International.

Garimella, H. T. (Author - Graduate Student), & Kraft, R. H. (Author). (November 2016). "Validation of embedded element method in the prediction of white matter disruption in concussions," ASME 2016 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Phoenix, AZ, peer-reviewed/refereed. International.

Lee, C. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (July 2016). "A coupled reaction-diffusion-strain model of bone growth in the cranial vault," The 12th World Congress on Computational Mechanics WCCM XII & The 6th Asia-Pacific Congress on Computational Mechanics APCOM VI, International Association for Computational Mechanics (IACM) and the Korean Society for Computational Mechanics (KSCM), Seoul, Korea.

Garimella, H. T. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (July 2016). "Modeling the electromechanical behavior of axonal fiber bundles," The 12th World Congress on Computational Mechanics WCCM XII & The 6th Asia-Pacific Congress on Computational Mechanics APCOM VI, International Association for Computational Mechanics (IACM) and the Korean Society for Computational Mechanics (KSCM), Seoul, Korea.

Kraft, R. H. (Author and Presenter), & Garimella, H. T. (Author - Graduate Student). (July 2016). "Modeling the mechanics of axonal fiber tracts using the embedded element method," The 12th World Congress on Computational Mechanics WCCM XII & The 6th Asia-Pacific Congress on Computational Mechanics APCOM VI, International Association for Computational Mechanics (IACM) and the Korean Society for Computational Mechanics (KSCM), Seoul, Korea.

Garimella, H. T. (Presenter - Graduate Student), & Kraft, R. H. (November 2015). "Modeling electromechanical deficits in the human brain," ASME 2015 International Mechanical Engineering Congress & Exposition, The American Society Of Mechanical Engineers, Houston, TX, peer-reviewed/refereed, published in proceedings. International.

Lee, C. (Author and Presenter - Graduate Student), Richtsmeier, J. T., & Kraft, R. H. (Author). (April 2015). "A computational model for biomechanical analysis of bone formation in the cranial vault," 1st Pan American Congresses on Computational Mechanics (PANACM), International Association for Computational Mechanics (IACM), Buenos Aires, Argentina, peer-reviewed/refereed, Invited.

Kraft, R. H., & Garimella, H. T. (April 2015). "Computational modeling of axonal injury using the embedded element approach," 1st Pan American Congresses on Computational Mechanics (PANACM), International Association for Computational Mechanics (IACM), Buenos Aires, Argentina, peer-reviewed/refereed, Invited.

Kraft, R. H., & Fielding, R. A. (April 2015). "Fracture networks in the human calcaneus due to impact loading," 1st Pan American Congresses on Computational Mechanics (PANACM), International Association for Computational Mechanics (IACM), Buenos Aires, Argentina, peer-reviewed/refereed.

Kraft, R. H. (January 2014). "Towards a micromechanics-based simulation of calcaneus fracture and fragmentation due to impact loading," Department of Defense, U.S. Army, Aberdeen Proving Ground, MD.

Zhang, J., Merkle, A. C., Carneal, C. M., Armiger, R. S., Kraft, R. H., Ward, E. E., Ott, K. A., Wickwire, A. C., Dooley, C. J., Harrigan, T. P., & Roberts, J. C. (September 2013). "Effects of torso-borne mass and loading severity on early response of the lumbar spine under high-rate vertical loading," International Research Council on Biomechanics of Injury, Sweden.

Kraft, R. H., Dagro, A. M., McKee, P. J., Grafton, S. T., Vettel, J., McDowell, K., Vindiola, M., & Merkle, A. C. (April 2013). "Combining the finite element method with structural network-based analysis for modeling neurotrauma," 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering (CMBBE), Salt Lake City, UT.

Kraft, R. H. (October 2011). "Computational failure modeling of lower extremities," A Survey of Blast Injury across the Full Landscape of Military Science, NATO-HFM-207 Panel, Halifax, Canada.

Kraft, R. H. (August 2011). "Spine modeling efforts and opportunities for future work," U.S. Army Research Laboratory/U.S. Army Medical Research and Material Command Home on Home Workshop, U.S Army Research Laboratory Research Portfolio Showcase, Aberdeen Proving Ground, MD.

Kraft, R. H. (March 2011). "BrainAid: A smartphone app for field-deployable multimodal screening and detection of mild traumatic brain injury," Neurodiagnostic for the Battlefield, U.S. Medical Research and Materiel Command, Fort Detrick, MD.

Kraft, R. H. (March 2011). "BrainAid: A smartphone app for field-deployable multimodal screening and detection of mild traumatic brain injury," Office of the Surgeon General, San Antonio, TX.

Demonstration

Kraft, R. H. (November 2010). "A structural mechanics-based approach for predicting neural deficits," Department of Defense/Department of Energy Neural Restoration Workshop at the Center for Neurotechnology Studies of the Potomac Institute for Policy Studies, Arlington, VA.

Cullen, D. K. (University of Pennsylvania), & Kraft, R. H. (October 2010). "Macro- to micro- biomechanics of traumatic brain injury," Biomedical Engineering Society Annual Meeting, Austin, TX.

Kraft, R. H. (August 2010). "A finite element-based comparative study between high rate accelerative and blast-induced head trauma," U.S. Army Research Laboratory's Accelerative Injury Workshop, Aberdeen Proving Ground, MD.

Kraft, R. H. (August 2010). "Development of a computational framework for high rate injury biomechanics of lower extremities," U.S. Army Research Laboratory's Accelerative Injury Workshop, Aberdeen Proving Ground, MD.

Kraft, R. H. (August 2010). "Recommendations for a field deployable diagnostic device for mild traumatic brain injury," Defense and Veterans Brain Injury Center/Combat Casualty Care Research Program of the U.S. Army Medical Research and Materiel Command/National Institutes of Neurological Disorders and Stroke of the National Institute of Health at the Advanced Technology Applications for Combat Casualty Care Conference, St. Pete's Beach, FL.

Cullen, D. K. (University of Pennsylvania), & Kraft, R. H. (June 2010). "Determining trauma-specific neuropathology based on macro- to micro-injury biomechanics," Neurotrauma Society Annual Meeting, Las Vegas, NV.

Kraft, R. H. (May 2010). "High rate computational brain injury biomechanics: Linkages with simulation-based neurophysiology," 1st Annual Ballistic Protection Technologies Workshop, Rockville, MD.

Kraft, R. H. (March 2010). "High fidelity computational injury biomechanics," The Technical Cooperation Program (TTCP), The Defence Science and Technology Laboratory (DSTL), Porton Down, UK.

Kraft, R. H. (March 2010). "High rate computational brain injury biomechanics: Linkages with simulation-based neurophysiology," Department of Defense Brain Injury Computational Modeling Expert Panel Meeting, Chantilly, VA.

Kraft, R. H. (January 2010). "Multiscale modeling of armor ceramics," American Ceramics Society International Conference and Exposition, Daytona Beach, FL.

Kraft, R. H. (November 2009). "A structural mechanics-based approach for predicting neural deficits," Neural Restoration Workshop, Potomac Institute for Policy Studies, Albuquerque, NM.

Kraft, R. H. (July 2008). "A micromechanics-based multiscale approach for simulating dynamic crack propagation," 8th World Congress on Computational Mechanics, Lido Island, Venice, Italy.

Kraft, R. H. (2007). "A parallel multiscale model for brittle materials using a finite element based micromechanical model and homogenization theory," American Physics Society Topical Group on Shock Compression of Condensed Matter, Kona, Hawaii.

Kraft, R. H. (2007). "Macroscopic measures of strength and damage computed from physically-based mechanisms at the micro-level," American Ceramics Society International Conference and Exposition, Cocoa Beach, FL.

Kraft, R. H. (July 2007). "Finite element based modeling of damage in brittle materials: From micro to macro," 9th U.S. National Congress on Computational Mechanics, San Francisco, CA.

Kraft, R. H. (April 2007). "Finite element based micromechanical modeling of brittle materials under compressive loading," 17th US Army Symposium on Solid Mechanics, Baltimore, MD.

Kraft, R. H. (November 2006). "A finite element based micromechanical damage model for brittle materials under compressive loading," American Society of Mechanical Engineers International Congress, Orlando, FL.

Kraft, R. H. (January 2006). "A computational framework for intergranular and cleavage fracture," American Ceramics Society International Conference and Exposition, Daytona Beach, FL.

Kraft, R. H. (November 2005). "Controlling microcracking events in ceramics: A grain boundary engineering approach," American Society of Mechanical Engineers International Congress, Orlando, FL.

### Panels

Kraft, R. H. (November 2022). "New Trends in Medical Devices Technology," The American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress & Exposition (IMECE) 2022, Columbus, Ohio, Invited.

Kraft, R. H. (June 2021). "International collaboration in mechanical engineering," Penn State Workshop: Celebrating International Research and Education Partnership (CIREP 2021), Remote, Invited.

### Posters

Reyes Kadozono, A., & Kraft, R. H. (March 2024). "Effect of seat angle on intervertebral disc in pilots exposed to high-G forces," Penn State Graduate Exhibition, Penn State Graduate School, University Park, PA.

Won Best Poster Award

Menghani, R. R., & Kraft, R. H. (August 2023). "Adding axonal fiber tractography to the brain simulation research platform​," Penn State Center for Neural Engineering Fall 2022 Retreat, Penn State Center for Neural Engineering, State College, PA.

Won Best Poster Award

Menghani, R. (Presenter - Graduate Student), & Kraft, R. H. (June 2023). "Analyzing real world head impacts using the brain simulation research platform," 2023 Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C), Vail, CO.

Huber, C. M., Patton, D. A., Kraft, R. H., & Arbogast, K. B. (June 2023). "Head kinematics and brain strain associated with adolescent soccer heading," Neurotrauma 2023, Austin, TX.

Menghani, R. R., & Kraft, R. H. (August 2022). "The brain simulation research platform: A sensor-enabled automated brain injury prediction service," Penn State Center for Neural Engineering Fall 2022 Retreat, Penn State Center for Neural Engineering, State College, PA.

Won Best Poster Award

### Posters and Oral Presentations

Martin, V. (Author and Presenter - Graduate Student), Kraft, R. H. (Author), & Ellis, S. (Los Alamos National Laboratory). (April 2020). "Multiscale Modeling of Dyneema using the Embedded Element Method," 2020 Mach Conference, Hopkins Extreme Materials Institute, Remote.

Kraft, R. H. (June 2019). "History dependent damage modelling for axonal fiber tracts of the brain," 2019 Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C), Seven Springs, PA, Invited.

Kraft, R. H. (Author and Presenter). (May 2019). "Multiscale modeling of axonal fiber tracts in the brain," Penn State Institute of the Neurosciences 2019 Neuro-Retreat, Institute of the Neurosciences, University Park, PA.

Hannah, T. W. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (April 2019). "Computationally confirmed Kolsky bar: An application to high rate testing of non-ideal Dyneema," 2019 Mach Conference, Hopkins Extreme Materials Institute, Annapolis, MD.

Lee, C., Dolack, M., Richtsmeier, J. T., & Kraft, R. H. (Author and Presenter). (September 2018). "A new reaction-diffusion-strain model for skull growth and defect formation," Center for Engineering MechanoBiology (CEMB) 2018 Mechanobiology Symposium, University of Pennsylvania NSF Center for Engineering MechanoBiology (CEMB), Philadelphia, PA.

Kraft, R. H. (Author and Presenter), & Slobounov, S. (July 2018). "Athlete-specific digital brain models to characterize every impact," 2018 Big Ten – Ivy League Traumatic Brain Injury Summit, Philadelphia, PA.

Kraft, R. H. (Author and Presenter). (April 2017). "A coupled reaction-diffusion-strain model of bone growth in the cranial vault," 11th Structural Birth Defects Meeting, Society for Developmental Biology, Bethesda, MD, Invited.

Garimella, H. T. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (November 2016). "Disruption in electromechanical behavior of axonal fiber tracts during concussion: A multiscale modeling approach," ASME 2016 International Mechanical Engineering Congress & Exposition, The American Society of Mechanical Engineers, Phoenix, AZ, peer-reviewed/refereed. International.

Yuchi, L. (Supervised Student), & Kraft, R. H. (Author). (September 2016). "Progress on bidirectional growth model of micro-tissue engineered neuronal networks (micro-TENNs)," Bernstein Conference in Computational Neuroscience, Berlin, Germany.

Hertel, Z. R., Schumacher, S. C., & Kraft, R. H. (Author). (April 2016). "Implementation of viscoelasticity into the CTH marker method," 2016 Mach Conference, Hopkins Extreme Materials Institute, Annapolis, MD.

Ranslow, A. N. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (April 2016). "The computational characterization of the multiaxial failure response of trabecular skull bone," 2016 Mach Conference, Hopkins Extreme Materials Institute, Annapolis, MD.

Motiwale, S. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (April 2016). "Understanding impact forces to the brain: Neural networks based impact classification for head impacts in sports," Penn State 13th Annual College of Engineering Research Symposium, Penn State Engineering Graduate Student Council, University Park, PA.

Motiwale, S. (Author and Presenter - Graduate Student), Eppler, W., Hollingsworth, D., Hollingsworth, C., Morgenthau, J., & Kraft, R. H. (Author). (February 2016). "Application of neural networks for filtering non-impact transients recorded from biomechanical sensors," The IEEE International Conference on Biomedical and Health Informatics (BHI), IEEE Engineering in Medicine and Biology Society (IEEE-EMBS), Las Vegas, NV.

Sodha, K. B. (Presenter - Undergraduate Student), & Kraft, R. H. (November 2015). "Exploration of miniaturized Kolsky bar designs for testing soft material properties at high loading rates using finite element modeling," ASME 2015 International Mechanical Engineering Congress & Exposition, The American Society Of Mechanical Engineers, Houston, TX, peer-reviewed/refereed. International.

Motiwale, S. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (March 2015). "Understanding impact forces to the brain: Neural networks based impact classification for head impacts in sports," Penn State Neuroscience Retreat, Penn State Institute of the Neurosciences, University Park, PA.

Lee, C. X. (Author and Presenter), Richtsmeier, J. T., & Kraft, R. H. (October 2014). "A computational analysis of bone formation in the cranial vault," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Lee, C. X. (Presenter - Graduate Student), Richtsmeier, J. T., & Kraft, R. H. (October 2014). "A computational analysis of bone formation in the cranial vault," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Fielding, R. A., Tan, X. G., Przekwas, A., & Kraft, R. H. (October 2014). "Finite element modeling of impact and injury to the lower extremity," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Ranslow, A. N., Ziegler, K. A., Satapathy, S. S., Radovitsky, R., & Kraft, R. H. (October 2014). "Microstructural analysis of porcine skull bone subjected to impact loading," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Garimella, H. T., & Kraft, R. H. (October 2014). "Reinforced composite based modeling of axonal injury - A physics based approach," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Garimella, H. T. (Author and Presenter - Graduate Student), & Kraft, R. H. (Author). (October 2014). "Reinforced composite based modeling of axonal injury - A physics based approach," The Mid-Atlantic American Physics Society (APS) Meeting, University Park, PA.

Kraft, R. H. (November 2005). "A numerical model for intergranular and cleavage fracture in ceramic materials," MRS Fall Meeting, Boston, MA.

### Seminars

Kraft, R. H. (November 2020). "On-demand, no-click brain simulations," Penn State Center for Neural Engineering Seminar, University Park, PA, Invited.

Kraft, R. H. (November 2019). "The emergence of digital health care: a focus on the brain," Mechanical Engineering Department Seminar, East Lansing, Michigan, Invited.

Kraft, R. H. (March 2017). "Multiscale modeling of the axonal tract level in the brain," Invited Speaker, 43rd Northeast Bioengineering Conference, New Jersey Institute of Technology (NJIT), Department of Biomedical Engineering, Newark, NJ, Invited.

Kraft, R. H. (March 2017). "Recent innovations in modeling the brain," Soldier Protection Sciences Branch Seminar Series, Army Research Laboratory, Aberdeen Proving Ground, MD, Invited.

Kraft, R. H. (October 2016). "Modeling axonal fiber tracts in the brain," Invited Speaker, Engineering Science and Mechanics Seminar Series, Penn State University, Department of Engineering Science and Mechanics, University Park, PA, Invited.

Kraft, R. H. (March 2016). "Modeling axonal fiber tracts in the brain," Invited Speaker, Department of Neurosurgery Seminar Series, University of Pennsylvania, Department of Neurosurgery, Philadelphia, PA, Invited.

Kraft, R. H. (March 2016). "Modeling axonal fiber tracts in the brain," Invited Speaker, Penn State University, Department of Biomedical Engineering, University Park, PA, Invited.

Kraft, R. H. (February 2016). "Modeling concussions in sports," Guest Lecture, KINES 497D: Concussion in Athletics: From Brain to Behavior, University Park, PA, Invited.

Kraft, R. H. (May 2015). "Modeling damage in axonal fiber tracts," Biomedical Engineering Seminar Series, New Jersey Institute of Technology, Department of Biomedical engineering, University Heights Newark, New Jersey, Invited.

Kraft, R. H. (April 2015). "Biomechanics of humans in extreme environments," Biomedical Engineering Seminar Series, Pontificia Universidad Catolica de Chile, Department of Structural and Geotechnical Engineering, Biomedical Engineering Group, Chile, Invited.

Kraft, R. H. (October 2013). "Damaged connectomes: A physics-based method to degrade brain networks," Penn State Center for Neural Engineering, University Park, PA, Invited.

Kraft, R. H. (Presenter). (September 2013). "The mechanics and response of humans in extreme environments," Mechanical and Nuclear Engineering Seminar Series, University Park, PA, Invited.

Kraft, R. H. (April 2013). "The mechanics and response of humans in extreme environments," Frontiers of Cyberscience Seminar Series, Penn State University, University Park, PA, Invited.

Kraft, R. H. (November 2012). "Connectome neurotrauma mechanics: Combining the finite element method with structural network-based analysis for modeling neurotrauma," Joint Materials/Solid Mechanics Seminar Series, Brown University, Providence, RI, Invited.

Kraft, R. H. (March 2012). "Computational trauma biomechanics," Applied Physics Laboratory Biomechanics Seminar Series, The Johns Hopkins University, Laurel, MD, Invited.

Kraft, R. H. (November 2010). "Biomechanical simulations with Sierra Presto," SIERRA Seminar Series, Sandia National Laboratories, Albuquerque, NM, Invited.

Kraft, R. H. (October 2009). "Multiscale modeling of brittle materials," Exxon Mobil Research Seminar Series, Exxon Mobil Strategic Research Center, Clinton, NJ, Invited.

Kraft, R. H. (March 2009). "High-fidelity computational injury biomechanics," Computational Solid Mechanics Laboratory Seminar Series, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland, Invited.

Kraft, R. H. (December 2006). "A finite element based micromechanical damage model for brittle materials under compressive loading," École Normale Supérieure, Solid Mechanics Seminar Series, Paris, France, Invited.

Kraft, R. H. (May 2003). "Optimization of a dynamic hardness test methodology," Impact Physics Branch Seminar Series, U.S. Army Research Laboratory, Invited.

## Description of Outreach or Other Activities in which there was Significant Use of Candidate's Expertise

### Outreach - Editorial Responsibilities

*ASME Journal of Engineering and Science in Medical Diagnostics and Therapy (JESMDT)*, Associate Editor. (November 2022 - Present).

*Frontiers in Bioengineering and Biotechnology*, Associate Editor. (November 2014 - Present).

### Outreach - Peer Review of Grant Proposals

Department of Defense, Reviewer. (October 2022).

National Institutes of Health, Panel Member. (2018).

National Science Foundation, Panel Member. (2017).

Department of Energy: Oak Ridge and Argonne National Laboratories, Reviewer. (2015 - 2016).

INCITE, the US-based allocation program that awards time on the petascale computer systems at the Oak Ridge and Argonne National Laboratories.

2 reviews (2015, 2016)

American Society for Engineering Education (ASEE). (2015).

Department of Defense, Reviewer. (2015).

Congressionally Directed Medical Research Programs (CDMRP), Reviewer. (2010 - 2012).

### Outreach - Peer Review of Manuscripts, etc.

*ACS Biomaterials Science & Engineering*

1 reviews total:  
1 review (2016). (2016)

*APS Physical Review Letters*

Reviewer. 6 reviews total:  
1 review (2017)  
2 reviews (2018)  
2 reviews (2019)  
1 review (2021). (2021)

*ASME Journal of Biomechanical Engineering*

Reviewer. 4 reviews total:  
1 review (2018)  
1 review (2021)  
2 reviews (2023). (2023)

*ASME Journal of Engineering and Science in Medical Diagnostics and Therapy*

Reviewer. 4 reviews total:  
1 review (2021)  
3 reviews (2023). (2023)

*Acta Biomaterialia*

Reviewer. 1 review total:   
1 review (2021). (2021)

*Advanced Science*

Reviewer. 1 review total:  
1 review (2023). (2023)

*Annals of Biomedical Engineering*

8 reviews total:  
2 reviews (2018)  
2 reviews (2019)  
2 reviews (2020)  
1 review (2021)  
1 review (2022). (2022)

*Annual Penn State College of Engineering Research Symposium*

Reviewer. (2015)

*Biomechanics and Modeling in Mechanobiology*

Reviewer. 13 papers total:  
1 review (2011)  
1 review (2013)  
1 review (2014)  
2 review (2016)  
2 reviews (2017)  
1 review (2018)  
2 reviews (2019)  
2 reviews (2020)  
1 review (2023). (2023)

*Bone*

Reviewer. 1 review total:  
1 review (2023). (2023)

*Brain Multiphyiscs*

Reviewer. 1 review total:  
1 review (2023). (2023)

*Computer Methods in Biomechanics and Biomedical Engineering*

Reviewer. 4 reviews total:  
1 review (2012)  
1 review (2019)  
1 review (2020)  
1 review (2023). (2023)

*ETRI Journal*

Reviewer. 1 reviews total:  
1 review (2019). (2019)

*Experimental Mechanics*

2 reviews total:  
1 review (2017)  
1 review (2018). (2018)

*Frontiers in Bioengineering and Biotechnology*

Reviewer. 4 reviews total:  
1 review (2019)  
1 review (2020)  
1 review (2021)  
1 review (2022). (2022)

*International Journal of Mechanical Sciences*

1 review total:   
1 review (2020). (2020)

*Journal of Biomechanics*

Reviewer. 5 reviews total:  
1 review (2016)  
1 review (2017)  
1 review (2018)  
1 review (2020)  
1 review (2023). (2023)

*Journal of Biomedical and Health Informatics*

Reviewer. 1 review total:  
1 review (2023). (2023)

*Journal of Integrative Neuroscience*

Reviewer. 1 review total:   
1 review (2021). (2021)

*Journal of Mechanics in Medicine and Biology*

Reviewer. 2 reviews total:  
1 review (2011)  
1 review (2013). (2013)

*Journal of Neurotrauma*

Reviewer. 4 reviews  
1 review (2010)   
1 review (2015)  
1 review (2017)  
1 review (2020). (2020)

*Journal of Visual Experiments (JoVE)*

Reviewer. 2 reviews total:  
1 review (2014)  
1 review (2015). (2014)

*Journal of the Mechanical Behavior of Biomedical Materials*

Reviewer. 4 reviews total:  
1 review (2016)  
1 review (2020)  
1 review (2021)  
1 review (2022). (2016)

*Machine Learning with Applications*

Reviewer. 1 review total:  
1 review (2023). (2023)

*Materials and Deisgn*

Reviewer. 1 review (2014). (2014)

*Mathematical and Computational Applications*

1 review total:   
1 review (2020). (2020)

*Nature Communications*

Reviewer. 1 review total:   
1 review (2021). (2021)

*Nature Protocols*

1 reviews total:  
1 review (2018). (2018)

*Neuroinformatics*

1 review total:   
1 review (2020). (2020)

*Numerical Methods in Biomedical Engineering*

2 reviews total:  
1 review (2017)  
1 review (2020). (2020)

*PLOS ONE*

Reviewer. 1 review (2012). (2012)

*Part H: Journal of Engineering in Medicine*

Reviewer. 2 reviews total:  
1 review (2019)  
1 review (2020). (2020)

*Scientific Reports*

Reviewer. 1 reviews total:  
1 review (2019). (2019)

*Sensors*

Reviewer. 1 review (2016). (2016)

*Summer Biomechanics, Bioengineering and Biotransport Conference (SB3C)*

Reviewer. 7 reviews total:

2 reviews (2016)

2 reviews (2017)

3 reviews (2018)

2 reviews (2019). (February 2016)

*Transactions of Biomedical Engineering*

1 review total:   
1 review (2023). (2023)

### Outreach - Other Use of Expertise

#### Collaboration with York County School of Technology

Extensive time spent working with high school students as part of NSF CAREER award. (April 2019 - 2022).

Worked extensively with York County School of Technology administration, faculty, staff and students to collect impact data from high school football players.  
2019 - Worked to collect data from football players.  
2020 - Worked with high school faculty and staff to analyze data.  
2021,2022 - Developed joint proposals to NSF for informal learning in STEM

#### Government Agencies

DoD Computational Brain Injury Modeling Expert Panel Member. (April 2009 - April 2012).

Contribute to and assess the state-of-the-art of computational models of non-impact blast-induced traumatic brain injuries and integrate ongoing DoD research efforts to accelerate the transition of prevention and treatment strategies.

Integrated Research and Product Teams for Traumatic Brain Injury Neurodiagnostics. (January 2009 - January 2012).

Serve as biomechanics expert to the U.S. Army Medical Research and Materiel Command (USAMRMC) Integrated Product Team (IPT) for noninvasive neurodiagnostics for traumatic brain injury development effort. Assist in the development and acquisition of an affordable medical product or suite of products to meet needs for Warfighters as quickly and efficiently as possible.

#### Outreach

Presented Sideline Science Program, Harford County, MD. (July 19, 2021 - July 30, 2021).

The Sideline Science Circuluum was developed as part of my NSF CAREER award. It aims to bring STEM topics and information about my research program to the community.   
2021 Outreach: One week at Harford Lacrosse Camp for Girls, One week at Harford Lacrosse Camp for Boys. Over 200 participants aged K-12 reached.

#### Provided Penn State University Tour

Penn State University Tour for York County School of Technology. (November 2019).

Organized day-long visitation from York County School of Technology faculty and students (approximately 20). The tour included many labs and facilities across Penn State.

#### Technical discussion about brain modeling research platform.

Meeting with Dr. Lee Gabler, Senior Engineer at Biocore, LLC. (July 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

Meeting with Dr. Chris Jones, Head of Science and Performance at Sports and Wellbeing Analytics Ltd. (May 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

Meeting with Scott Featherman, Director of Business Development at Airboss Defense Group (ADG). (May 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

Meeting with Doug King, Clinical Nurse Specialist (Minor Injuries) at Hutt Valley DHB Research Fellow University of New England, Australia. (April 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

Meeting with Gregory Tierney, Lecturer in Sport and Exercise Biomechanics at Ulster University. (April 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

Meeting with Stevie Ward, Former Professional Rugby Player, Director of Mantality and Director of Welfare at Canada Co-Operative Championship Rugby League. (April 2021).

Attempt to spread the word about the brain simulation research platform in hopes of increasing awareness, collaboration, and users on the platform.

## Projects, Grants, Commissions, and Contracts

### Awarded

Agency: Air Force Research Laboratory

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Development of Predictive Disc Degeneration Simulations for Pilots

|  |  |
| --- | --- |
| Total Requested: $360,000.00 | Award Amount: $359,796.00 Total Anticipated: $359,796.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: May 4, 2022 | Awarded Date: September 27, 2022 |
| Start Date: September 30, 2022 | End Date: September 30, 2025 |

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Elucidating High Strain Rate Deformation Mechanisms in Penetration-Resistant Composites

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| --- | --- |
| Total Requested: $607,913.00 | Award Amount: $214,423.00 Total Anticipated: $607,913.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: March 18, 2022 | Awarded Date: July 7, 2022 |
| Start Date: June 16, 2022 | End Date: September 30, 2024 |

Amendments:  
OSP Number: 248679, Total awarded: $125,000.00. Total anticipated: $624,423.00. June 16, 2022 - September 30, 2024  
OSP Number: 244927, Total awarded: $285,000.00. Total anticipated: $607,913.00. June 16, 2022 - June 30, 2024

Agency: Chuck Noll Foundation [MP]

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Examining the link between finite element-based strain predictions and cognitive changes.

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| --- | --- |
| Total Requested: $77,589.00 | Award Amount: $77,589.00 Total Anticipated: $77,589.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: May 16, 2022 | Awarded Date: December 7, 2022 |
| Start Date: August 1, 2022 | End Date: August 1, 2024 |

Agency: Sports & Wellbeing Analytics

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Unfunded Collaborative Research Agreement - Sports & Wellbeing Analytics

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| --- | --- |
| Total Requested: $1.00 | Award Amount: $1.00 Total Anticipated: $1.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: February 1, 2021 | Awarded Date: March 17, 2021 |
| Start Date: March 17, 2021 | End Date: March 16, 2024 |

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s): Hill, Kathleen

Project Title: CAREER: Multiscale Modeling of Axonal Fiber Bundles in the Brain

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| Total Requested: $499,999.00 | Award Amount: $396,514.00 Total Anticipated: $500,000.00 |
| Budget Effort | 99% credit |
| Submitted for Funding: July 19, 2018 | Awarded Date: February 26, 2019 |
| Start Date: February 15, 2019 | End Date: January 31, 2024 |

Amendments:  
OSP Number: 228455, Total awarded: $70,000.00. Total anticipated: $570,000.00. February 15, 2019 - January 31, 2024  
OSP Number: 221841, Total awarded: $103,486.00. Total anticipated: $500,000.00. February 15, 2019 - January 31, 2024

Agency: Karagozian & Case, Inc.

Principal Investigator: Hillman, Michael

Co-Investigator(s): Kraft, Reuben H. (Co-Principal Investigator)

Project Title: STTR PHASE II Enhancing Thermo-Mechanically Coupled Computational Models for High-Temperature Impact and Fracture

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| --- | --- |
| Total Requested: $358,228.00 | Award Amount: $179,000.00 Total Anticipated: $358,228.00 |
| Budget Effort | 50% credit |
| Submitted for Funding: October 30, 2020 | Awarded Date: September 3, 2021 |
| Start Date: July 1, 2021 | End Date: December 2, 2023 |

Amendments:  
OSP Number: 238905, Total awarded: $179,228.00. Total anticipated: $358,228.00. July 1, 2021 - December 2, 2023

Agency: Biokinetics and Associates Ltd

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Occupational mTBI from repeated exposure to low-level blast

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| --- | --- |
| Total Requested: $111,000.00 | Award Amount: $111,000.00 Total Anticipated: $111,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: June 30, 2021 | Awarded Date: July 12, 2022 |
| Start Date: May 1, 2022 | End Date: March 31, 2023 |

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Development of a Novel Ballistic Armor Concept using FEM

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| Total Requested: $108,917.00 | Award Amount: $56,363.00 Total Anticipated: $108,917.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: February 7, 2017 | Awarded Date: July 27, 2017 |
| Start Date: July 24, 2017 | End Date: March 31, 2022 |

Amendments:  
OSP Number: 228063, Total awarded: $175,007.00. Total anticipated: $817,569.00. July 24, 2017 - March 31, 2022  
OSP Number: 216395, Total awarded: $60,645.00. Total anticipated: $449,562.00. July 24, 2017 - September 30, 2020  
OSP Number: 214988, Total awarded: $193,000.00. Total anticipated: $817,569.00. July 24, 2017 - September 30, 2021  
OSP Number: 214828, Total awarded: $50,000.00. Total anticipated: $449,562.00. July 24, 2017 - September 30, 2020  
OSP Number: 213069, Total awarded: $86,787.00. Total anticipated: $254,315.00. January 30, 2019 - September 30, 2020  
OSP Number: 208524, Total awarded: $230,000.00. Total anticipated: $449,562.00. July 24, 2017 - September 30, 2020  
OSP Number: 206830, Total awarded: $52,554.00. Total anticipated: $108,917.00. July 24, 2017 - September 30, 2019

Agency: Sandia National Laboratories

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: An Exploration of the Material Point Method (MPM) in CTH Applied to Soft Material Systems Subjected to Dynamic Loading (Continuation)

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| --- | --- |
| Total Requested: $309,692.00 | Award Amount: $50,000.00 Total Anticipated: $309,692.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: August 5, 2016 | Awarded Date: June 30, 2017 |
| Start Date: February 2, 2017 | End Date: December 31, 2021 |

Amendments:  
OSP Number: 219830, Total awarded: $80,186.00. Total anticipated: $80,186.00. January 11, 2021 - December 31, 2021  
OSP Number: 213096, Total awarded: $100,000.00. Total anticipated: $400,889.00. February 2, 2017 - December 31, 2020  
OSP Number: 206447, Total awarded: $100,000.00. Total anticipated: $309,692.00. February 2, 2017 - December 31, 2019  
OSP Number: 200317, Total awarded: $100,000.00. Total anticipated: $309,692.00. February 2, 2017 - December 31, 2018  
OSP Number: 197834, Total awarded: $50,889.00. Total anticipated: $309,692.00. February 2, 2017 - December 31, 2017

Agency: Air Force Research Laboratory

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Development of Predictive Disc Degeneration Simulations for Pilots

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| --- | --- |
| Total Requested: $39,315.00 | Award Amount: $39,315.00 Total Anticipated: $39,315.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: September 30, 2020 | Awarded Date: February 22, 2021 |
| Start Date: February 22, 2021 | End Date: August 21, 2021 |

Agency: SURVICE Engineering Company, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Head Kinematics Experimentation and Data Analysis

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| --- | --- |
| Total Requested: $5,000.00 | Award Amount: $5,000.00 Total Anticipated: $5,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: August 3, 2020 | Awarded Date: May 6, 2021 |
| Start Date: September 1, 2020 | End Date: May 31, 2021 |

Agency: Icahn School of Medicine at Mount Sinai

Principal Investigator: Richtsmeier, Joan T.

Co-Investigator(s): Drew, Patrick (Co-Principal Investigator), Kraft, Reuben H. (Co-Principal Investigator)

Project Title: Craniosynostosis Network (formerly award number 0254-3543-4609)

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| --- | --- |
| Total Requested: $322,692.00 | Award Amount: $322,692.00 Total Anticipated: $1,828,411.00 |
| Budget Effort | 20% credit |
| Submitted for Funding: January 4, 2019 | Awarded Date: March 19, 2019 |
| Start Date: February 1, 2016 | End Date: January 31, 2021 |

Agency: University of Pittsburgh

Principal Investigator: Szczesny, Spencer

Co-Investigator(s): Niyibizi, Christopher (Co-Investigator), Kraft, Reuben H. (Co-Investigator), Wong, Pak K. (Co-Investigator)

Project Title: Stem Cell Mechanotransduction with Tendon Fatigue

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| --- | --- |
| Total Requested: $50,335.00 | Award Amount: $50,335.00 Total Anticipated: $50,335.00 |
| Budget Effort | 5% credit |
| Submitted for Funding: July 30, 2019 | Awarded Date: August 9, 2019 |
| Start Date: July 1, 2019 | End Date: June 30, 2020 |

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: SBIR Phase II:    Global-Local Modeling of Aircraft Occupant Safety Assessment during Ejection (Air Force Phase II SBIR)

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| --- | --- |
| Total Requested: $264,122.00 | Award Amount: $139,494.00 Total Anticipated: $260,930.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: March 8, 2017 | Awarded Date: February 9, 2018 |
| Start Date: October 25, 2017 | End Date: January 20, 2020 |

Amendments:  
OSP Number: 206108, Total awarded: $121,436.00. Total anticipated: $260,930.00. October 25, 2017 - January 20, 2020

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Development of Commercial Tools for Brain Modeling

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| --- | --- |
| Total Requested: $100,637.00 | Award Amount: $70,637.00 Total Anticipated: $100,637.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: June 9, 2017 | Awarded Date: February 15, 2018 |
| Start Date: November 15, 2017 | End Date: September 15, 2019 |

Amendments:  
OSP Number: 205456, Total awarded: $30,000.00. Total anticipated: $100,637.00. November 15, 2017 - September 15, 2019

Agency: University of Pittsburgh

Principal Investigator: Szczesny, Spencer

Co-Investigator(s): Niyibizi, Christopher (Co-Investigator), Kraft, Reuben H. (Co-Investigator), Wong, Pak K. (Co-Investigator)

Project Title: Stem Cell Mechanotransduction with Tendon Fatigue

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| --- | --- |
| Total Requested: $99,998.00 | Award Amount: $49,666.00 Total Anticipated: $113,273.00 |
| Budget Effort | 5% credit |
| Submitted for Funding: February 28, 2018 | Awarded Date: October 31, 2018 |
| Start Date: July 1, 2018 | End Date: June 30, 2019 |

Agency: Massachusetts Institute of Technology

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: NEUP: Multilayer Composite Fuel Cladding for LWR Performance Enhancement and Severe Accident Tolerance

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| --- | --- |
| Total Requested: $0.00 | Award Amount: $50,000.00 Total Anticipated: $100,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: | Awarded Date: November 7, 2016 |
| Start Date: October 1, 2015 | End Date: June 30, 2019 |

Amendments:  
OSP Number: 198750, Total awarded: $50,000.00. Total anticipated: $150,000.00. October 1, 2015 - June 30, 2019

Agency: SURVICE Engineering Company, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Embedded Finite Elements for a Multiscale, Multifunctional Approach for Modeling Axonal Bundles

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| --- | --- |
| Total Requested: $135,160.00 | Award Amount: $114,460.00 Total Anticipated: $135,160.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: September 29, 2017 | Awarded Date: January 11, 2018 |
| Start Date: December 13, 2017 | End Date: March 13, 2019 |

Amendments:  
OSP Number: 201592, Total awarded: $20,700.00. Total anticipated: $135,160.00. December 13, 2017 - March 13, 2019

Agency: Pennsylvania, University of

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Biological Living Electrodes Using Tissue Engineered Axonal Tracts to Probe and Modulate the Nervous System (Previously Agreement #569770)

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| --- | --- |
| Total Requested: $0.00 | Award Amount: $124,527.00 Total Anticipated: $124,527.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: | Awarded Date: February 27, 2018 |
| Start Date: August 1, 2017 | End Date: July 31, 2018 |

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: STTR Phase I:    Synchronizing Video Imagery with Wearable Sensor Data and Side-by-Side Modeling Software to Develop Healthy Habits in Children

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| --- | --- |
| Total Requested: $132,750.00 | Award Amount: $132,750.00 Total Anticipated: $132,750.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: December 7, 2015 | Awarded Date: August 15, 2016 |
| Start Date: July 1, 2016 | End Date: June 30, 2018 |

Agency: Icahn School of Medicine at Mount Sinai

Principal Investigator: Richtsmeier, Joan T.

Co-Investigator(s): Drew, Patrick (Co-Principal Investigator), Kraft, Reuben H. (Co-Principal Investigator), Rizk, Elias B. (Co-Principal Investigator)

Project Title: Craniosynostosis Network

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| --- | --- |
| Total Requested: $1,828,411.00 | Award Amount: $374,032.00 Total Anticipated: $750,336.00 |
| Budget Effort | 25% credit |
| Submitted for Funding: January 24, 2014 | Awarded Date: August 6, 2015 |
| Start Date: February 1, 2015 | End Date: January 31, 2018 |

Amendments:  
OSP Number: 196914, Total awarded: $380,778.00. Total anticipated: $1,828,411.00. February 1, 2016 - January 31, 2018  
OSP Number: 189119, Total awarded: $376,304.00. Total anticipated: $750,336.00. February 1, 2015 - January 31, 2017

Agency: IAP Worldwide Services, Inc.

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Embedded Finite Elements for a Multiscale, Multifunctional Approach for Modeling Axonal Bundles

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| Total Requested: $221,066.00 | Award Amount: $107,684.00 Total Anticipated: $221,066.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: August 31, 2016 | Awarded Date: April 13, 2017 |
| Start Date: October 1, 2016 | End Date: September 24, 2017 |

Agency: Massachusetts Institute of Technology

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Microstructural Analysis of Porcine Skull Bone Subjected to Impact Loading

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| --- | --- |
| Total Requested: $196,000.00 | Award Amount: $98,000.00 Total Anticipated: $158,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: June 30, 2014 | Awarded Date: February 19, 2015 |
| Start Date: July 1, 2014 | End Date: September 1, 2017 |

Amendments:  
OSP Number: 185004, Total awarded: $60,000.00. Total anticipated: $158,000.00. July 1, 2014 - September 1, 2017

Agency: Pennsylvania, University of

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Biological Living Electrodes Using Tissue Engineered Axonal Tracts to Probe and Modulate the Nervous System (Previously Agreement #568000)

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| --- | --- |
| Total Requested: $0.00 | Award Amount: $122,898.00 Total Anticipated: $128,898.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: | Awarded Date: February 6, 2017 |
| Start Date: August 1, 2016 | End Date: July 31, 2017 |

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: SBIR: Phase II: A Neck Injury Assessment Tool for Prolonged Wear of Head Supported Mass

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| Total Requested: $140,000.00 | Award Amount: $69,086.00 Total Anticipated: $140,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: July 11, 2014 | Awarded Date: August 4, 2015 |
| Start Date: April 21, 2015 | End Date: June 14, 2017 |

Amendments:  
OSP Number: 187223, Total awarded: $70,914.00. Total anticipated: $140,000.00. April 21, 2015 - June 14, 2017

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: SBIR Phase II:    Physics and Physiology Based Human Body Model of Blast Injury and Protection

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| Total Requested: $200,000.00 | Award Amount: $100,000.00 Total Anticipated: $200,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: July 11, 2014 | Awarded Date: August 5, 2015 |
| Start Date: April 1, 2015 | End Date: May 31, 2017 |

Amendments:  
OSP Number: 187145, Total awarded: $100,000.00. Total anticipated: $200,000.00. April 1, 2015 - May 31, 2017

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Global-Local Modeling of Aircraft Occupant Safety Assessment during Ejection (Air Force SBIR Phase I)

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| Total Requested: $22,000.00 | Award Amount: $22,000.00 Total Anticipated: $22,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: February 16, 2016 | Awarded Date: December 1, 2016 |
| Start Date: August 4, 2016 | End Date: April 15, 2017 |

Agency: Sandia National Laboratories

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: An Exploration of the Material Point Method (MPM) in CTH Applied to Soft Material Systems Subjected to Dynamic Loading

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| Total Requested: $190,644.00 | Award Amount: $190,644.00 Total Anticipated: $484,635.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: January 31, 2015 | Awarded Date: April 30, 2015 |
| Start Date: January 16, 2015 | End Date: December 31, 2016 |

Agency: Pennsylvania, University of

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Biological Living Electrodes Using Tissue Engineered Axonal Tracts to Probe and Modulate the Nervous System

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| Total Requested: $368,790.00 | Award Amount: $120,313.00 Total Anticipated: $120,313.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: February 10, 2015 | Awarded Date: January 20, 2016 |
| Start Date: September 30, 2015 | End Date: July 31, 2016 |

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: A Neck Injury Assessment Tool for Prolonged Wear of Head Supported Mass

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| Total Requested: $18,568.00 | Award Amount: $18,568.00 Total Anticipated: $18,568.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: June 24, 2013 | Awarded Date: April 2, 2014 |
| Start Date: January 15, 2014 | End Date: August 14, 2014 |

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Physics and Physiology Based Human Body Model of Blast Injury and Protection

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| Total Requested: $36,000.00 | Award Amount: $36,000.00 Total Anticipated: $36,000.00 |
| Budget Effort | 100% credit |
| Submitted for Funding: June 25, 2013 | Awarded Date: February 26, 2014 |
| Start Date: January 7, 2014 | End Date: August 6, 2014 |

### Pending

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Continuation 2024: Elucidating high strain rate deformation mechanisms in penetration-resistant composites

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| Total Requested: $100,000.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: October 18, 2024

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Elucidating high strain rate deformation mechanisms in penetration-resistant composites

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| Total Requested: $125,000.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: September 27, 2024

Agency: Chuck Noll Foundation [MP]

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Quantifying, not exploring, the link between finite element-based strain predictions and cognitive changes

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| Total Requested: $116,884.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: September 17, 2024

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Continuation 2024: Elucidating high strain rate deformation mechanisms in penetration-resistant composites

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| Total Requested: $872,492.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: July 10, 2024

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Computed brain strain as a digital biomarker for acute mild traumatic brain injury: a clinical study

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| Total Requested: $426,310.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: June 16, 2023

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: NSF Supplemental: Expansion of data science approaches and techniques for a cloud-based brain modeling research platform

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| Total Requested: $70,000.00 |  |
| Budget Effort | 100% credit |

Submitted for Funding: January 10, 2022

### Not Funded

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: The brain simulation research platform: A scalable, cloud-based, open-source tool for computational brain modeling

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| Total Requested: $428,342.00 |  |

Date Not Funded: June 16, 2023

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: The brain simulation research platform: A scalable, cloud-based, open-source tool for computational brain modeling

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| Total Requested: $410,362.00 |  |

Date Not Funded: June 16, 2023

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Development of a Sideline Science Mobile Curriculum for Advancing Informal STEM Learning

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| Total Requested: $1,328,222.00 |  |

Date Not Funded: June 16, 2023

Agency: Triad National Security, LLC (was LANL - Los Alamos National Laboratory)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Continuation (Shared): Elucidating high strain rate deformation mechanisms in penetration-resistant composites

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| Total Requested: $423,087.00 |  |

Date Not Funded: June 16, 2023

Agency: University of Texas at El Paso

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Accelerated Discovery of Materials for Extreme Condition Applications

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| Total Requested: $284,400.00 |  |

Date Not Funded: June 8, 2022

Agency: University of Leeds

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Investigating the incidence, mechanism, and severity of football heading

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| Total Requested: $5,003.00 |  |

Date Not Funded: July 8, 2021

Agency: University of Leeds

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: The biomechanical brain response to head acceleration events in rugby union: An opportunity for the development of player protection strategies

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| Total Requested: $14,984.00 |  |

Date Not Funded: July 8, 2021

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Advancing Informal STEM Learning in Neuroscience using Sports, Biomechanical Sensors and Brain Simulations

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| Total Requested: $354,013.00 |  |

Date Not Funded: November 12, 2019

Agency: University of the Pacific

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Increasing Engineering Students Professional Modeling Skills with Embedded Learning Objectives from NAFEMS

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| Total Requested: $472,421.00 |  |

Date Not Funded: November 12, 2019

Agency: National Science Foundation

Principal Investigator:

Co-Investigator(s): Kraft, Reuben H. (Core Faculty)

Project Title: MRI: Acquisition of a 14 Tesla Magnetic Resonance Micro-Imaging System for Rheological, Biological and Materials Research

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| Total Requested: $1,599,149.00 |  |

Date Not Funded: October 1, 2019

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: RET Site: CLUSTER - CLassroom teachers Using Supercomputers Through Experiences in Research

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| Total Requested: $599,814.00 |  |

Date Not Funded: June 6, 2019

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: BrainSafe: An integrated brain modeling and cognitive monitoring system

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| Total Requested: $87,000.00 |  |

Date Not Funded: February 19, 2019

Agency: Army Research Office

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: DURIP: Ultra High-Speed Camera and Rigging for Enabling an Integrated Computational and Experimental Approach to High-Strain-Rate Material Characterization

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| Total Requested: $342,950.00 |  |

Date Not Funded: February 19, 2019

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: STTR: Digital Brain: An integrated brain modeling and cognitive monitoring system

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| --- | --- |
| Total Requested: $87,000.00 |  |

Date Not Funded: July 21, 2018

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: NSF STTR Phase II Synchronizing Video Imagery with Wearable Sensor Data and Side-by-Side Modeling Software to Develop Healthy Habits in Children

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| Total Requested: $350,136.00 |  |

Date Not Funded: July 3, 2018

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: NSF STTR Phase II Synchronizing Video Imagery with Wearable Sensor Data and Side-by-Side Modeling Software to Develop Healthy Habits in Children

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| Total Requested: $346,026.00 |  |

Date Not Funded: July 3, 2018

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Essential Enhancements to ATBM Subsystems in support of iPredict

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| Total Requested: $110,000.00 |  |

Date Not Funded: June 12, 2018

Agency: Defense Advanced Research Projects Agency

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: DARPA YFA: Computational Design and Modeling of Self-Forming Biological Living Electrodes

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| Total Requested: $748,262.00 |  |

Date Not Funded: June 12, 2018

Agency: University of the Pacific

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Collaborative Research: Active Engineering Education Modules for Learning Finite Element Analysis

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| --- | --- |
| Total Requested: $361,957.00 |  |

Date Not Funded: June 12, 2018

Agency: Congressionally Directed Medical Research Programs

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: An integrated sensor and modeling platform for assessing brain injury

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| Total Requested: $750,000.00 |  |

Date Not Funded: May 2, 2018

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Advancing Informal STEM Learning in Neuroscience using Sports, Biomechanical Sensors and Brain Simulations

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| Total Requested: $477,558.00 |  |

Date Not Funded: February 24, 2018

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Collaborative Proposal:Towards a Multiscale Computational Model of Chronic Traumatic Encephalopathy (CTE): Exploration of the FundamentalMechanisms of Tau Propagation in the B

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| Total Requested: $299,998.00 |  |

Date Not Funded: February 24, 2018

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Tempo and Mechanobiology of Craniofacial Development

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| --- | --- |
| Total Requested: $2,990,177.00 |  |

Date Not Funded: February 24, 2018

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: STTR Phase I: Synchronizing Video Imagery with Wearable Sensor Data and Side-by-Side Modeling Software to Develop Healthy Habits in Children

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| Total Requested: $25,000.00 |  |

Date Not Funded: February 24, 2018

Agency: National Football League

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: My Digital Brain: A Sensor-Enabled, Continuous Simulation of an Athletes Brain to Monitor Impacts and Provide a Digital Biomarker of CTE

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| Total Requested: $409,602.00 |  |

Date Not Funded: December 4, 2017

Agency: Centers for Disease Control and Prevention

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Use of biomechanical data and injury modeling for training and prevention of brain injury in young athletes

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| Total Requested: $1,278,040.00 |  |

Date Not Funded: July 11, 2017

Agency: University of the Pacific

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Active Engineering Education Modules for Learning Finite Element Analysis

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| Total Requested: $28,007.00 |  |

Date Not Funded: June 30, 2017

Agency: Office of Naval Research

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: ONR YIP: Digital Biomarkers for Brain Injury

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| Total Requested: $510,000.00 |  |

Date Not Funded: April 28, 2017

Agency: CoachSafe PlaySafe, LLC

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: STEM Platform for Keeping Kids Active

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| Total Requested: $570,000.00 |  |

Date Not Funded: April 28, 2017

Agency: Football Research, Inc.

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: An Integrated Athlete Monitoring, Diagnostic and Protection System

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| Total Requested: $535,495.00 |  |

Date Not Funded: April 10, 2017

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Tempo and Mechanobiology of Craniofacial Development

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| Total Requested: $3,793,977.00 |  |

Date Not Funded: March 20, 2017

Agency: National Institutes of Health

Principal Investigator:

Co-Investigator(s): Kraft, Reuben H. (Co-Principal Investigator)

Project Title: A Methodology to Generate Multi-scale Finite-Element Model of the Lower-Leg

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| Total Requested: $409,185.00 |  |

Date Not Funded: November 15, 2016

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Leveraging FaceBase Data to Validate Computational Models of Skull Growth

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| Total Requested: $356,277.00 |  |

Date Not Funded: November 7, 2016

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: The Transition of a Numerical Tool for Analyzing the Physics-Based Response of Diffusion Tensor Tractography to an Industry Partner

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| Total Requested: $157,200.00 |  |

Date Not Funded: August 11, 2016

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: A Computational Model of Chronic Traumatic Encephalopathy (CTE)

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| Total Requested: $405,926.00 |  |

Date Not Funded: July 28, 2016

Agency: Congressionally Directed Medical Research Programs

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: A Validated Multiscale Computational Model of the Effects of Vibrational Forces on Spinal Cord Injury During Medical Transport

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| Total Requested: $719,173.00 |  |

Date Not Funded: May 9, 2016

Agency: Office of Naval Research

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: YIP: An In Silico Approach to Modeling Incapacitation in the Brain: Connectome Neurotrauma Mechanics

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| Total Requested: $508,637.00 |  |

Date Not Funded: April 5, 2016

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Damaged Connectomes: A Physics-Based Approach to Model Neuronal Damage Across Scales which Integrate with Network Theories of the Brain

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| Total Requested: $1,094,716.00 |  |

Date Not Funded: April 5, 2016

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s): Richtsmeier, Joan T. (Co-Principal Investigator)

Project Title: Mechanisms of Early Skull Formation and Mechanobiology of Cranial Growth Dynamics

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| Total Requested: $626,188.00 |  |

Date Not Funded: March 8, 2016

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s): Kraft, Reuben H.

Project Title: CAREER: Embedded Finite Elements for a Multiscale, Multifunctional Approach for Modeling Axonal Bundles

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| Total Requested: $545,459.00 |  |

Date Not Funded: January 6, 2016

Agency: Triax Technologies, Inc.

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: SBIR:    Novel Advancements to Biomechanical Head Impact Sensors

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| Total Requested: $78,885.00 |  |

Date Not Funded: October 20, 2015

Agency: Icahn School of Medicine at Mount Sinai

Principal Investigator:

Co-Investigator(s): Kraft, Reuben H. (Co-Principal Investigator)

Project Title: Craniosynostosis Network (Project 1 - Revision)

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| --- | --- |
| Total Requested: $1,490,704.00 |  |

Date Not Funded: September 8, 2015

Agency: Defense Advanced Research Projects Agency

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: YFA: Composing Neuromodulation Symphonies: An Approach to Understand and Leverage Biophysical Mechanisms of Acoustic Ultrasound Delivered to Peripheral Nerves

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| Total Requested: $500,000.00 |  |

Date Not Funded: August 13, 2015

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Quantifying Load Induced Subsidence of Artificial Intervertebral Discs and its Effect on the Kinetics of the Cervical Spine

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| Total Requested: $340,609.00 |  |

Date Not Funded: July 15, 2015

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Influence of Chondrocranium Formation Associated with the Mechanobiology of Cranial Growth Dynamics

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| Total Requested: $694,315.00 |  |

Date Not Funded: July 15, 2015

Agency: Intelligence Advanced Research Projects Activity

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Machine Learning Inspired By Functional Optimization in Micro-Tissue Engineered Neural Networks

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| Total Requested: $2,623,392.00 |  |

Date Not Funded: June 19, 2015

Agency: Office of Naval Research

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: YIP: Embedded Axonal Fiber Tracts: A Multiscale, Multifunctional Approach for Modeling the Brain

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| Total Requested: $471,207.00 |  |

Date Not Funded: June 16, 2015

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: CAREER: Connectome Neurotrama Mechanics - A Multiscale, Multifunctional Physics-Based Approach to Degrade Brain Networks

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| Total Requested: $500,000.00 |  |

Date Not Funded: January 30, 2015

Agency: CFD Research Corporation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: STTR: Predictive Modeling of Protective Body Armor under Burst Ballistic Impacts

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| Total Requested: $50,000.00 |  |

Date Not Funded: January 30, 2015

Agency: U.S. Department of Justice

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Computational Tools for Forensic Biomechanics

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| Total Requested: $444,261.00 |  |

Date Not Funded: October 17, 2014

Agency: NineSigma

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Innovative Approaches For Preventing And Identifying Brain Injuries

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| Total Requested: $229,884.00 |  |

Date Not Funded: September 30, 2014

Agency: National Science Foundation

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Multiscale Computational Histomorphogesis: Linking Genetics with Continuum Mechanics to Elucidate Mechanisms of Cranial Growth

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| Total Requested: $400,000.00 |  |

Date Not Funded: August 4, 2014

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: A Computational and Experimental Study of Mammalian Embryonic Development in Microgravity

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| Total Requested: $382,078.00 |  |

Date Not Funded: April 29, 2014

Agency: Defense Health Program (DoD)

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: A multi-scale, multi-functional computational model of the effects of immobilization, gravitational and vibrational forces on spinal cord injury (SCI) during medical transport

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| Total Requested: $632,902.00 |  |

Date Not Funded: April 29, 2014

Agency: National Institutes of Health

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Investigation of a Physics-based Computational Model for Predicting Risk, Initiation and Propagation of Chronic Traumatic Encephalopathy (CTE) after Traumatic Brain Injury

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| Total Requested: $133,168.00 |  |

Date Not Funded: February 10, 2014

Agency: Center for the Advancement of Science in Space

Principal Investigator: Kraft, Reuben H.

Co-Investigator(s):

Project Title: Optimizing the Morphogenesis of Stem Cells During Mammalian Embryonic Development in Microgravity: A Combined Computational and Experimental Approach

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| Total Requested: $1,212,500.00 |  |

Date Not Funded: September 19, 2013

## List of Grants and Contracts for Improvement of Instruction, With an Indication of the Candidate's Role in Preparing and Administering the Grants and Contracts

### Not Funded

Kraft, R. H., Kraft, R. H. (Principal Investigator), "Active Engineering Education Modules: For Learning Finite Element Analysis," University of the Pacific, Universities and Colleges. Total requested: $47,497.00. (submitted: January 12, 2016, date not funded: October 24, 2016)

Kraft, R. H. (Core Faculty), Kraft, R. H. (Principal Investigator), "Active Engineering Education Modules For Learning Finite Element Analysis," University of the Pacific, Universities and Colleges. Total requested: $53,044.00. (submitted: January 12, 2015, date not funded: September 29, 2015)

## Other Evidence of Research or Creative Accomplishments

**Patent Intellectual Property**

Kraft, R. H. "Brain Simulation Technology." (application: 2017).

Kraft, R. H. "SmartGear:    Instrumented Wrestling Headgear using Sensors." (application: 2017).

Kraft, R. H. "Method and Apparatus for Multimodal Mobile Screening to Quantitatively Detect Brain Function Impairment," Patent or Patent Application Number: http://www.google.com/patents/US20120330178. (application: September 2011).  
U.S. Army Research Laboratory (ARL), Ranked P0 (Sufficient Government Interest) by ARL Invention Evaluation Committee.  
http://www.google.com/patents/US20120330178

**Impact in Society of Research Scholarship and Creative Accomplishment**

Interview, "WCU, Penn State partner to produce data collecting mouthguards for football players," Television, https://www.wsoctv.com/news/local/wcu-penn-state-partner-produce-data-collecting-mouthguards-football-players/2C2TGGI5FRAKDPRAP7SO2JRTKM/, WSOCTV. (January 3, 2024).

Article, "Engineering and Athletics team up with Penn State on head impact research," Newspaper. (December 26, 2023).

Article, "Engineering and Athletics team up with Penn State on head impact research," Internet, Westen Carolina University. (December 18, 2023).

Article, "High-tech mouthguard: WCU, Penn State collaborate on concussion study for sports safety," Internet. (December 10, 2023).

Interview, "Penn State professor, a North Harford alum, brings interactive brain injury information to Harford Lacrosse Camp," Newspaper, Baltimore Sun. (August 2021).

Article, "Engineering students worldwide learn new skills using Penn State's supercomputer," Internet. (2018).

https://news.psu.edu/story/526030/2018/06/22/academics/engineering-students-worldwide-learn-new-skills-using-penn-states

Article, "Computation combats concussion damage," Internet. (2017).

https://sciencenode.org/feature/computation-combats-concussion-damage.php

Article, "Computation combats concussion damage," Internet. (2017).

https://news.psu.edu/story/493944/2017/11/13/research/computation-combats-concussion-damage

Article, "Behind the Connectome Commotion," Internet. (2013).

http://biomedicalcomputationreview.org/content/behind-connectome-commotion

Article, "ARL researcher receives highest presidential award for science, engineering research," Internet. (2011).

https://www.arl.army.mil/www/default.cfm?article=743

## Record of Membership in Professional and Learned Societies

### National

Member, American Society of Mechanical Engineers. (January 2003 - Present).

Member, United States Association for Computational Mechanics. (February 2014 - 2015).

Member, American Physical Society. (May 2013 - 2014).

Member, American Society for Engineering Education. (May 2013 - 2014).

Member, American Society of Biomechanics. (May 2013 - 2014).

## Description of New Courses and/or Programs Developed, Including Service Learning and Outreach Courses

Kraft, R. H., Course, "Introduction to Modern Computational Tools for Mechanical Engineering." (2017).

This undergraduate course is aimed at giving students perspective and introductory skills on the use of modern computational tools for solving mechanical engineering problems. The course has two main thrusts focused on finite element analysis for structural/thermal mechanics and computational fluid dynamics.

## Description of New Computer Software Programs Developed

Embedded Element Methods and Algorithms (EEMA), Kraft, R. H. (2018)

https://github.com/PSUCompBio/compbio

## Description of New Methods of Teaching Established Courses and/or Programs

Kraft, R. H., Course, "Online course videos." (2023).

Developed high-quality instructional videos for ME 330, 360, 461, and 563 and have made them accessible on YouTube. These videos have garnered more than 98,900 views and a total of 11,377 hours of watch time.

Kraft, R. H. (Co-Developer), Course, "ME330: Computational Tools for Engineers." (2020).

## Honors or Awards for Scholarship, Research, or Creative Activities

### Scholarship/Research

Outstanding Presentation Award, Penn State Center of Neural Engineering. (August 2023).

Awarded to mentored graduate student Ritika R. Menghani at Center of Neural Engineering Retreat. Title of talk was Adding axonal fiber tractography to the brain simulation research platform.

Best Poster Award, Penn State Center of Neural Engineering. (August 2022).

Mentored graduate student Ritika R. Menghani won Best Lighting Talk at Center of Neural Engineering Retreat. Title of poster was The Brain Simulation Research Platform: A Sensor-Enabled Automated Brain Injury Prediction Service

Faculty Early Career Development (CAREER) Program Award, National Science Foundation. (2019).

*National Science Foundation's* most prestigious *awards* in support of early-*career* faculty who have the potential to serve as academic role models in research and education

Shuman Early Career Professorship, Penn State University Department of Mechanical and Nuclear Engineering. (2013 - 2016).

First Place Paper and Oral Presentation (presented by my graduate student, I was senior author on paper), 13th Annual Penn State College of Engineering Research Symposium (CERS). (April 2016).

Oral presentation by Shruti Motiwale, a Master's student in my research group. Entitled "A Non-linear Damage Model for the Annulus of the Intervertebral Disc Under Cyclic Loading, Including Recovery"

People's Choice Poster Award (presented by my student, I was senior author on poster), 2016 (Ernst) Mach Conference. (April 2016).

Poster presented by Allison Ranslow, a Master's student in my research group. Entitled "Computational Characterization of the Multiaxial Failure Response of Trabecular Skull Bone"

Presidential Early Career Awards for Scientists and Engineers (PECASE), The White House; Office of Science and Technology Policy. (2011).

Highest honor bestowed by the United States government on outstanding scientists and engineers in the early stages of their independent research careers.

## Technology Transferred or Adapted in the Field

Kraft, R. H., "Brain Simulation Research Platform," A number of companies, universities, and government laboratories. In Progress. (September 2021).

A number of companies, universities, and government laboratories (U.S Army Research Laboratory, Defence Research and Development Canada (DRDC)) have used the cloud-based platform for understand brain biomechanics.

Kraft, R. H., "Finite Element Models of Leg Fractures." Completed. (2014).

Computational models transitioned to sponsor, CFDRC, Inc.

Kraft, R. H., "Finite Element Models of Spine Disc Degeneration." Completed. (2014).

Computational models transitioned to sponsor, CFDRC, Inc.

## Technical Assistance Provided

Participated in FedTech Startup Bootcamp at request of Army Research Laboratory. Number of Hours of Assistance: 50. (October 2018 - January 2019).



# SERVICE AND THE SCHOLARSHIP OF SERVICE TO

# THE UNIVERSITY, SOCIETY, AND THE PROFESSION

This section contains the following, listed in standard bibliographic form with the most recent date first. (Do not include material contained in other sections of the Dossier.) The list below is intentionally comprehensive and inclusive of all disciplines. Candidates are not expected to have an entry for every category.

• Service to the University

1. Record of administrative assignments at the department, division, school, campus, college and University levels

2. Record of committee work at the department, division, school, campus, college, and University levels

3. Participation in campus and/or University-wide governance bodies and related activities

4. Record of academic leadership and support work (college representative, faculty mentoring, assessment activities, etc.)

5. Record of contributions to the University's programs to enhance diversity, equity, inclusion, and belonging

6. Assistance to student organizations

7. Participation in recruitment and retention activities

8. Participation in development/fundraising activities

9. Other

• Service to society as a representative of the University (limit the list to those activities that use the candidate’s professional expertise)

1. Participation in community affairs

2. Service to governmental agencies at the international, federal, state, or local levels

3. Service to business and industry

4. Service to public and private organizations

5. Service to citizen/client groups

6. Testifying as an expert witness

7. Service to enhance diversity, equity, inclusion, and belonging

8. Other (e.g., participation in task forces, authorities, meetings, etc. of public, nonprofit, or private organizations)

• Service to the disciplines and to the profession

1. Organizing conferences, service on conference committees

2. Active participation in professional and learned societies (e.g., offices held, committee work, and other responsibilities)

3. Service to enhance diversity, equity, inclusion, and belonging

4. Other

• List of honors or awards for leadership and/or service to the University, community, or the profession

(07-01-2023)

# SERVICE AND THE SCHOLARSHIP OF SERVICE TO

# THE UNIVERSITY, SOCIETY, AND THE PROFESSION

## Service to the University

##### Record of Committee Work at Department, Division, School, Campus, College, and University Levels

##### Department

Mechanical Engineering Promotion and Tenure Committee, Committee Member. (July 2022 - Present).

Mechanical Engineering Strategic Plan Tracking Committee, Chairperson. (August 2023 - May 2024).

Promotion and Tenure Committee, Member. (August 2023 - May 2024).

Research Advancement Committee, Member. (August 2023 - May 2024).

Teaching Load Policy Committee, Chairperson. (September 2022 - May 2023).

Department Facilities Committee, Member. (August 2022 - May 2023).

Promotion and Tenure Committee, Member. (August 2022 - May 2023).

Research Advancement Committee, Member. (August 2022 - May 2023).

Mechanical Engineering Strategic Planning Committee, Committee Member. (January 2022 - December 2022).

Teaching Load Policy Committee, Chairperson. (September 2020 - May 2021).

Mechanical Engineering Strategic Planning Committee, Member. (August 2019 - September 2020).

Joint Faculty Search in Mechanical Engineering and the Institute for CyberScience, Chairperson. (August 2018 - May 2019).

Faculty Search Committee for Mechanical Systems in Mechanical Engineering, Member. (August 2017 - 2018).

Mechanical Engineering Liaison to Institute for CyberScience, Liaison. (2017 - 2018).

Faculty Search Committee for Emerging Areas in Mechanical Engineering, Member. (August 2016 - 2017).

Faculty Search Committee for Mechanical Systems in Mechanical Engineering, Search Committee for Mechanical Systems in Mechanical Engineering, Member. (September 2014 - March 2015).

##### College

Engineering laptop Initiative, Member. (July 2021 - December 2021).

Developed laptop recommendations for college.

Activity Insight Faculty Users Committee, Member. (October 2017 - December 2020).

##### University

Institute for Computational & Data Sciences Coordinating Committee, Chairperson. (August 2023 - May 2024).

Graduate Council Committee on Academic Standards, Graduate Council Committee on Academic Standards, Committee Member. (June 2023 - May 2024).

Graduate Council Representative to Engineering Faculty, Committee Member. (June 2023 - May 2024).

Institute for Computational & Data Sciences Coordinating Committee, Co-Chairperson. (August 2022 - May 2023).

Hiring Committee for Project Coordinator for Institute for CyberScience, Member. (March 2019 - April 2019).

##### Record of Academic Leadership and Support Work (College Representative, Faculty Mentoring, Assessment Activities, etc.)

##### Academic Leadership and Support Work

##### Department

Biomechanics & Biodevices Research Supergroup Department Lead, Representative. (August 2023 - May 2024).

Biomechanics & Biodevices Research Supergroup Department Lead, Representative. (August 2022 - May 2023).

##### College

College of Engineering National Science Foundation CAREER Award Winners, Member. (April 2016).

##### Participation in Development/Fundraising Activities

##### University

AI/ML Faculty Engagement Team on behalf of Institute for CyberScience, Member. (October 2019 - May 2020).

Faculty Participant, Coalition team sent to IBM research headquarters on behalf of Institute for CyberScience, Member. (April 2019).

Participate in 2-day meeting to explore collaboration opportunities.

##### Competition Judging

##### College

College of Engineering Symposium for Undergraduate Research, College of Engineering Symposium for Undergraduate Research, Judge. (April 2014).

Judged Posters for Undergraduate Exhibition

## Service to Society as a Representative of the University

### Participation in Community Affairs

President of Organization, State College Warriors Lacrosse, Volunteer. (March 2022 - Present).

Head Lacrosse Coach, State College Warriors Lacrosse, Volunteer. (March 2018 - Present).

2019 Spring League 8U (Boys)  
2019 Winter League 8U (Boys)  
2020 Spring League 8U (Boys)  
2021 Spring League 10U (Boys)  
2022 Spring League 10U (Boys)  
2023 Spring League 12 U (Boys)

Cub Master, Pack 44 Cub Scouts (Pine Grove Mills), Volunteer. (August 2018 - 2023).

2018 Tiger Den Chief  
2019 Wolf Den Chief  
2020 Bear Den Chief  
2020 Pack Cubmaster  
2021 Webelos 1 Den Chief, Pack Cubmaster  
2022 Webelos 2/Arrow of Light Den Chief, Pack Cubmaster

Guest Speaker and Book Reader, Ferguson Township Elementary School, Speaker, Local. (April 2018).

I spoke to kindergarten-aged students about engineering careers and read them a book entitled "Dream, Invent, Create: Engineer the World".

Head T-Ball Coach, State College Little League, Volunteer. (2017).

Present brain health talk during the season.

Head Soccer Coach, American Youth Soccer Organization, Volunteer. (August 2014 - October 2016).

U6 age group.    Present concussion awareness talk during the season.

Liaison, State College High School, Representative. (February 2014 - 2015).

Penn State representative to State College High School Science, Technology, Engineering and Mathematics Planning Committee trying to build collaboration.

Guest Speaker and Book Reader, Ferguson Township Elementary School, Speaker, Local. (November 2015).

I spoke to kindergarten-aged students about engineering careers and read them a book entitled "Dream, Invent, Create: Engineer the World".

Concussion Awareness Seminar, Presenter. (August 2014).

Provide a description and overview of biomechanical impact sensors to State College Assembly of God Developmental Boys Football Program.

### Service to Governmental Agencies at the International, Federal, State, or Local Levels

NDSEG Fellowship Evaluation Panelist, National Defense Science and Engineering Graduate (NDSEG) Fellowship program, Panelist. (2015).

## Service to the Disciplines and to the Profession

### Organizing Conferences and Service on Conference Committees

Steering Committee Member (Elected), American Society of Mechanical Engineering International Mechanical Engineering Congress and Exposition (IMECE). (2021 - Present).

Technical Chair (Elected), American Society of Mechanical Engineering International Mechanical Engineering Congress and Exposition (IMECE). (November 2023 - November 2024).

Elected, 5-year term.

Organizer for Biological and Biomimetic Soft Materials Symposium, 2024 Mach Conference, Co-Organizer. (April 2024).

Vice Technical Chair (Elected), American Society of Mechanical Engineering International Mechanical Engineering Congress and Exposition (IMECE). (November 2022 - November 2023).

Elected, 5-year term.

Chair of Brain and Injury Mechanics Symposium, Brain and Injury Mechanics Symposium, SB3C Conference, Co-Chairperson. (June 2023).

Organizer for Biological and Biomimetic Soft Materials Symposium, 2023 Mach Conference, Co-Organizer. (April 2023).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2022 ASME International Mechanical Engineering Congress and Exposition (IMECE). (November 2021 - November 2022).

Track Co-Chair, Biomedical & Biotechnology Engineering Track at the 2022 ASME International Mechanical Engineering Congress and Exposition (IMECE). (November 2021 - November 2022).

Organizer for Injury Biomechanics Symposium, 2022 Society of Engineering Science (SES) Annual Technical Meeting, Co-Organizer. (February 2022 - October 2022).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2021 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2020 - November 2021).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2020 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2019 - November 2020).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2019 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2018 - November 2019).

Chair of Brain Biomechanics II - Measurement and modeling Symposium, Brain Biomechanics II - Measurement and modeling Symposium, Co-Chairperson. (August 2019).

Chair of Growth Remodeling and Repair II: Musculoskeletal System Symposium, Summer Biomechanics, Bioengineering, and Biotransport (SB3C) Conference, Co-Chairperson. (June 2019).

Activities Part of American Society of Mechanical Engineers (ASME) Bioengineering Division (BED).

Primary Organizer and Co-Chairperson, Special symposium on "Computational Modeling of Morphogenesis: Friend or Foe?" at the annual meeting of American Association of Anatomists (AAA), Co-Chairperson. (May 2018 - April 2019).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at 2018 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2017 - November 2018).

Co-Organizer, "Multiscale Brain Mechanics: From Growth to Injury" Symposium at 18th U.S. National Congress for Theoretical and Applied Mechanics, Co-Organizer. (August 2017 - June 2018).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2017 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2016 - November 2017).

Primary Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2016 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (November 2015 - November 2016).

Co-Chairperson, Brain Injury Symposium at Summer Biomechanics, Bioengineering, and Biotransport (SB3C) Conference, Co-Chairperson. (June 2016).

Activities Part of American Society of Mechanical Engineers (ASME) Bioengineering Division (BED).

Co-Organizer and Co-Chairperson, Damage Biomechanics Symposium at the 2015 ASME International Mechanical Engineering Congress and Exposition (IMECE), Co-Organizer. (December 2014 - November 2015).

Co-Organizer and Co-Chairperson, Advances in Computational Biomechanics Symposium at 2015 Pan-American Congress on Computational Mechanics International Conference, Co-Organizer. (June 2014 - June 2015).

Co-Organizer and Co-Chairperson, 2014 Mid-Atlantic Section (M-AS) of the American Physical Society (APS), Co-Organizer. (January 2014 - October 2014).

## Honors or Awards for Leadership and/or Service to the University, Community, or the Profession

##### Leadership

Eagle Scout, Boy Scouts of America. (1998).

##### Service, Professional

Fellow, American Society of Mechanical Engineering. (October 2023).

For sustained and outstanding contributions to the field of computational biomechanics with a particular focus on brain applications, and for extensive service and leadership to ASME.



# EXTERNAL LETTERS OF ASSESSMENT

# (FOR PROMOTION AND FINAL TENURE REVIEWS)

This section contains:

• Description of how the letters of assessment were solicited, including a sample letter or request, and a description of the procedure for selecting external evaluators.    Note: When letters are solicited, the request should be for letters of assessment rather than “recommendations” or “endorsements,” and evaluators should be encouraged to concentrate on those aspects of the candidate’s record which are most important to the external visibility and professional standing of the candidate.

• List of materials sent to external evaluators (e.g., copies of publications, vita, narrative statement, etc.).

• Identification of those who have written assessments, including a brief statement of the referee’s achievements and standing in his/her discipline.

• A log showing the date on which each external letter was requested by the department/dean, and the date the letter was received. All requests should be entered for everyone who has agreed to write a letter and has received the materials,    regardless of whether a response was obtained. Only those external letter writers who agreed to serve as an external letter writer and were subsequently sent the materials specified in the request to external letter writers, typically the curriculum vitae, a narrative {research/artistic} statement, and copies of selected publications/examples/evidence of their creative accomplishments should be in the log.

(07-01-2024)



# STATEMENTS OF EVALUATION OF THE CANDIDATE BY

# REVIEW COMMITTEES AND ADMINISTRATORS

This section contains:

\*Evaluative statements assessing the candidate’s strengths and weaknesses with respect to University and local criteria shall be provided at campus, department, college, and University levels.    Each of these evaluative statements is inserted in the candidate’s dossier at each step in the review process in the following order:

      1. For tenure cases, all previous tenure review evaluations, presented in chronological order, beginning with the earliest probationary reviews

      2. Campus review committee (if appropriate)

      3. Campus chancellor (if appropriate)

      4. Secondary department head (if appropriate)

\*\* 5. Department review committee (if appropriate)

      6. Department head, or other appropriate unit head; e.g., division head or school director (if appropriate)

      7. College review committee (if appropriate)

      8. College dean or campus chancellor

      9. University Promotion and Tenure Review Committee (if appropriate)

The author(s) of the comments and recommendations at each of the above levels of review shall indicate the relative emphasis given to each of the University and local criteria/expectations in the evaluation of each candidate for promotion and tenure.    When a candidate has not received a unanimous committee vote, the evaluation shall include a discussion of the reasons for the divergent opinions.

All committee reports should list the entire membership, be signed and dated by at least the Chair.

The numerical vote of each committee should be reported.

\*    Evaluative statements are required for tenure cases only. Post-tenure dossiers do not require prior evaluative statements.

\*\* An individual’s performance in an intercollege research program should be evaluated in writing by the program director or by appropriate faculty member(s).

(07-01-2014)