DAVID SCRIPKA

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Expertise

MATERIALS SCIENCE – MATERIAL BEHAVIOR IN EXTREME CONDITIONS

- Highly coupled multi-physics simulations of mechanical and optical material behavior in extreme environments
- Laser-driven shock compression experiments employing velocity interferometry and time-resolved optical spectroscopy

DATA ANALYTICS

- Multivariate data analysis, with focus areas in signal processing, image analysis, and statistical uncertainty estimation
- Data cleaning/processing, analysis, and visualization with R, Python, MATLAB, Microsoft Excel, and Tableau

COMMUNICATION

- Experienced in effectively organizing and presenting technical information in both formal and informal settings
- Experienced in writing academic papers, technical reports, summary/review documents, and policy analyses

Education

PhD MATERIALS SCIENCE AND ENGINEERING – *Georgia Institute of Technology - Atlanta, GA - 2013 to 2017*

- 4.0/4.0 GPA
- Minor in Public Policy

B.S. MATERIALS SCIENCE AND ENGINEERING – *Georgia Institute of Technology - Atlanta, GA - 2010 - 2012*

- 3.9/4.0 GPA
- Highest Honor, Biomaterials Certificate

Work Experience

GRADUATE RESEARCH ASSISTANT – *Georgia Institute of Technology -Atlanta, GA - Jan 2013 to present*

- Designed and conducted novel experiments with high-energy lasers, custom fabricated photonic structures, and time-resolved spectroscopy to study the behavior of complex structural and energetic materials in extreme environments
- Designed and performed complex multi-physics simulations to predict the combined mechanical-optical response of photonic structures in extreme environments, integrating multiple computational techniques and simulation software packages
- Designed, built, and calibrated complex experimental capabilities employing time-resolved spectroscopy and high-energy lasers

NATIONAL SECURITY DIVISION SUMMER ASSOCIATE – *Congressional Budget Office - Washington, DC - June to Aug 2016*

- Independently performed a comprehensive risk analysis of the vulnerability of the US electric grid to cyber-attacks
- Organized and summarized analysis methods, results, and conclusions in detailed oral and written reports

ENERGETIC MATERIALS INTERN – *Lawrence Livermore National Laboratory - Livermore, CA - May to Aug 2012*

- Evaluated and tested an empirical material behavior model by comparing simulation predictions to experimental data
- Identified and corrected an unknown inaccuracy in a material model by mathematically reformulating a key model input

UNDERGRADUATE RESEARCH ASSISTANT – *Georgia Institute of Technology - Atlanta, GA - Nov 2010 to Dec 2012*

- Characterized the structure and experimentally tested the mechanical behavior of a novel aluminum/steel composite armor
- Performed multi-physics simulations of high speed aluminum extrusion to identify important effects in rail-gun launch systems
- Applied multiple electron microscopy methods to identify chemical reactions in shock-compressed nickel/aluminum nano-foils
- Simulated micrometer scale interactions in granular-type materials to evaluate the effectiveness of microscopic sensors

INTERIOR MATERIALS INTERN – *General Motors Corporation - Warren, MI - May to Aug 2011*

- Planned, coordinated, and directed a large-scale field inspection of used vehicles to evaluate real-world material performance
- Performed large-scale mechanical wear testing of molded plastic materials to evaluate intrinsic durability of different designs
- Designed and programmed an automated Microsoft Excel spreadsheet to validate material property data in digital databases
- Organized, analyzed, and presented complex data to GM Department Managers in person and in written reports

Research Publications

- **David Scripka**, Garrett LeCroy, Gyuhyon Lee, Changyan Sun, Zhitao Kang, Christopher J. Summers, Naresh N. Thadhani. *"Spectral Response of Multilayer Optical Structures to Dynamic Loading."* Shock Compression of Condensed Matter - 2015: Proceedings of the Conference of the American Physical Society Topical Group (2017)
- **David Scripka**, Garrett LeCroy, Christopher J. Summers, Naresh N. Thadhani *"Spectral Response of Multilayer Optical Structure to Dynamic Mechanical Loading."* Applied Physics Letters **106**, 201906 (2015)
- **David Scripka**, Sunil Dwivedi, Naresh Thadhani. *"Correlating computationally derived particle surface stress-strain states to mesoscale shock response."* Journal of Physics: Conference Series **500** 182038, 2014
- Zhitao Kang, Alexandr A. Bansihev, Gyuhyon Lee, **David Scripka**, Jennifer Breidenich, Pan Xiao, James M. Christensen, Min Zhou, Christopher J. Summers, Dana D. Dlott, Naresh N. Thadhani. *"Exploration of CdTe quantum dots as mesoscale pressure sensors via time-resolved shock-compression photoluminescent emission spectroscopy."* Journal of Applied Physics **120,** 43107 (2016).
- Pan Xiao, Zhitao Kang, Alexandr A. Bansihev, Jennifer Breidenich, **David Scripka**, James M. Christensen, Christopher J. Summers, Dana D. Dlott, Naresh N. Thadhani, Min Zhou. *"Laser-excited optical emission response of CdTe quantum dot/polymer nanocomposite under shock compression."* Applied Physics Letters, **108**, 011908 (2016)

Academic and Professional Projects

GRADUATE STUDENT EXPERIENCE SURVEY ANALYSIS– *Georgia Institute of Technology, Atlanta, GA – 2016 to 2017*

- Managed a team of graduate and professional students in the organization, analysis, and visualization of the results from a comprehensive survey of Georgia Tech graduate students. Nearly 5,000 graduate students completed the survey, producing almost 1 million data points. The analysis and conclusions were presented to College Deans, Provosts, and many other senior faculty and administrators at Georgia Tech, resulting in new policies, initiatives, and other positive impacts.

ALIXPARTNERS CONSULTING CASE COMPETITION: ATLANTA COMMUNITY FOOD BANK – *Atlanta, GA - 2015*

- Worked with a team of four to analyze a strategic plan for a community food bank expansion, designed new distribution schemes and program re-structuring, and presented recommendations to professional industry consultants from AlixPartners, LLP.

2015 MACC CONSULTING CASE COMPETITION: PHARMACEUTICAL PORTFOLIO – *Bethesda, Maryland - 2015*

- Worked with a team of 5 students to analyze a hypothetical pharmaceutical portfolio, offered strategic recommendations for long-term revenue optimization and market-share growth, and presented recommendations to professional consultants from McKinsey & Company, Boston Consulting Group, UMT Consulting, and other professional consulting groups.

GEORGIA TECH PHD THESIS TEMPLATE – *Georgia Institute of Technology, Atlanta, GA - 2016*

- Managed a team of graduate students in the development of the Georgia Tech PhD thesis template, providing both LaTeX and Microsoft Word versions to the 6,000+ graduate student body.

Leadership and Service

VOLUNTEER CONSULTANT – *Community Consulting Teams (CCT) Atlanta - Atlanta, GA - 2016 to present*

- Worked with a team of 5 to update and organize the policy and procedures manual for Community Advanced Practice Nurses, a non-profit free clinic offering health care services to homeless and economically disadvantaged residents

GRADUATE STUDENT BODY PRESIDENT – *Georgia Institute of Technology – May 2016 to April 2017*

- Primary representative and advocate for 6,500+ graduate students, working extensively with senior Faculty and Administrators
- Develops and manages institute-wide graduate student initiatives, defining Graduate Student Government priorities and plans

GRADUATE STUDENT GOVERNMENT EXEC. BOARD MEMBER – *Georgia Institute of Technology - Aug 2015 to May 2016*

- Directed the development of the Georgia Tech PhD Thesis template, working with the GT Department of Graduate Studies
- Helped manage initiatives, elections, appointments to institute-wide committees, and general operations of the legislative body

GRADUATE STUDENT GOVERNMENT SENATOR – *Georgia Institute of Technology - Aug 2014 to May 2016*

- Represented the graduate student body to responsibly allocate ~$2 million to student groups and campus services
- Served on institute committees to discuss and set policy on topics ranging from student health to technology-enhanced teaching

STUDENT MENTOR – *MSE Student Mentor Program - Georgia Institute of Technology - Atlanta, GA - 2015 to 2016*

- Personally mentors multiple undergraduate students, advising on academic issues, professional goals, and career plans

FINANCIAL ACCOUNTANT – *Harbour East Asia – Fall 2015 to 2016*

- Maintains financial records for 501(c)(3) non-profit organization, advises on long-term program and financial strategies

BOARD MEMBER – *MSE Graduate Student Advisory Group - Georgia Institute of Technology - Atlanta, GA - 2014 to 2015*

- Advised the MSE Department on policy changes and initiatives, planned and ran professional development events for students
- Aided in the planning, organization, and implementation of the graduate student recruitment process for the MSE department
- Aided in the planning, organization, and implementation of a MSE poster event with 35+ presenters and over $10,000 in awards

Formal Communication

ORAL PRESENTATIONS

- *"Novel Meso-Scale Sensors Employing Multi-Layered Photonic Crystal Structures for Probing Shock-Compression Effects in Heterogeneous Materials."* 2015 Materials Research Society International Conference, Boston, MA
- *"Spectral Response of Multilayer Optical Structures to Dynamic Loading."* 2015 American Physical Society - Shock Compression of Condensed Matter International Conference, Tampa, FL
- *"Dynamic Mechanical and Optical Response of Dielectric Mirrors and Optical Microcavities."* 2014 Aeroballistics Range Association International Symposium, Arcachon, France
- **20+** additional academic and professional talks from miscellaneous events, both formal and informal settings

POSTER PRESENTATIONS

- *"Spectral Response of Multilayer Optical Structures to Dynamic Loading."* 2015 American Physical Society - Shock Compression of Condensed Matter International Conference, Tampa, FL
- *"Correlating Computationally Derived Particle Surface Stress-Strain States to Mesoscale Shock Response,"* 2013 American Physical Society - Shock Compression of Condensed Matter International Conference, Seattle, WA
- *"Spectral Response of Multilayer Optical Structures to Dynamic Loading."* 2015 Materials Research Society International Conference, Tampa, FL
- *"Dynamic Mechanical and Optical Response of Dielectric Mirrors and Optical Microcavities."* 2015 Minerals, Metals, and Materials Society International Conference, Orlando, FL
- **8+** additional poster presentations from miscellaneous conferences, events, and classes, both formal and informal settings

Honors and Awards

PROFESSIONAL FELLOWSHIPS AND AWARDS

- **American Society for Engineering Education National Defense Science & Engineering Graduate Fellowship** – 2014 to 2017
- **Georgia Institute of Technology President's Fellowship –** 2013 to 2017
- **Georgia Institute of Technology Federal Jackets Fellowship –** 2016
- Invited Student Speaker – 2014 ARA International Symposium
- Poster Award – 2016 Defense Threat Reduction Agency Basic Research Program Technical Review
- Best Poster Nominee – 2015 Materials Research Society International Conference
- 1st in category Poster Award – 2015 Georgia Tech Materials Science & Engineering Poster Session
- 2nd in category Poster Award – 2014 Georgia Tech Materials Science & Engineering Poster Session
- 2nd in category Poster Award – 2014 Georgia Tech Institute for Materials Poster Session
- Student Travel Award – 2013 APS-SCCM International Conference
- Student Travel Award – 2015 APS-SCCM International Conference
- Student Travel Award – 2014 ARA International Symposium

ACADEMIC AWARDS

- Georgia Institute of Technology Faculty Honors – **10** Semesters, 2010 to 2015
- Duncan A. (Sr.) and Elizabeth M. Mellichamp Scholarship – Spring 2012
- Georgia Institute of Technology Dean's List – **2** Semesters, 2011

Technical Skills

Programming Languages: R, Python, LaTeX, MATLAB, HTML/CSS, Javascript, Node.js, VBA, BASH, C++, SQL
Office Productivity: Microsoft Office (Word/Powerpoint/Excel), LibreOffice/OpenOffice, Windows 7/8/10, Linux/Unix
Data Analytics Software: Rstudio, MATLAB, Tableau, Excel, SAS
Communication: Public speaking (formal and informal settings), technical writing
Laboratory Equipment: Lasers, velocity interferometry, oscilloscopes and circuits, optics and fiber optics, machining tools
Physics Simulation Software: Simulia Abaqus, ANSYS Workbench, COMSOl Multiphysics, ALE3D, CTH, MEEP