

Jeremy J. Dawkins

Weapons & Systems Engineering Department
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RESEARCH INTERESTS

- ◆ Vehicle Modeling and Simulation
- ◆ Unmanned Vehicle Systems
- ◆ Multi-Vehicle Collaboration
- ◆ Vehicle State Estimation
- ◆ Terrain Modeling
- ◆ Mobile Sensor Networks
- ◆ Human Machine Interaction
- ◆ Tribology & Contact Mechanics

EDUCATION

Auburn University

Ph.D. Mechanical Engineering 2011

Dissertation: *Terrain Characterization and Roughness Estimation for Control of Unmanned Ground Vehicles*

Directed by: Dr. David Bevly & Dr. Robert Jackson

Georgia Institute of Technology

M.S. Mechanical Engineering 2008

Thesis: *Influence of crystallographic orientation in normal and sliding contacts*

Directed by: Dr. Richard Neu.

North Carolina Agricultural and Technical State University

B.S. Mechanical Engineering 2006 (summa cum-laude)

CERTIFICATIONS

Passed the NCEES Fundamentals of Engineering Exam, North Carolina

EXPERIENCE

Research

August 2012 – Present

Weapons & Systems Engineering Dept.

Assistant Professor

- ◆ Developed terrain based control algorithms for unmanned ground vehicles
- ◆ Implemented Real Time terrain characterization methodologies on experimental vehicle
- ◆ Designed vehicle model based terrain estimators

January 2012 – July 2012

GPS & Vehicle Dynamics Lab, Auburn University

Research Associate

- ◆ Developed vehicle simulation environment in MATLAB
- ◆ Implemented ground vehicle control algorithms on experimental vehicle

January 2008 –
December 2011

GPS & Vehicle Dynamics Lab, Auburn University

Graduate Research Assistant

Research Advisor: David Bevly, Mechanical Engineering

- ◆ Developed terrain characterization algorithms for unmanned ground vehicles
- ◆ Determined critical vehicle parameters based on terrain and vehicle dynamics
- ◆ Created a fractal based terrain generation methodology for vehicle simulation

August 2006 –
December 2007

Mechanical Properties Research Lab, Georgia Institute of Technology

Graduate Research Assistant

Research Advisor: Richard Neu, Mechanical Engineering

- ◆ Conducted finite element modeling of sliding and normal contacts
- ◆ Implemented crystal plasticity model to account for micro-structural effects
- ◆ Investigated the effects of crystallographic orientation on energy dissipation

May 2006 – August
2006

Summer Undergraduate Research in Engineering, Georgia Institute of Technology

Undergraduate Research Assistant

- ◆ Developed finite element contact model using ABAQUS
- ◆ Simulated contact of polycrystalline copper

Teaching

Fall 2012

Weapons and Systems Engineering Department, U.S. Naval Academy

ES301 Modeling and Simulation

Assistant Professor

- ◆ Prepared lesson plans, homework, and exams
- ◆ Coordinated Lab section

Summer 2011

Department of Mechanical Engineering, Auburn University

MECH 2210 Statics and Dynamics

Instructor

- ◆ Prepared lesson plans, homework, and exams
- ◆ Coordinated Lab section to coincide with course material
- ◆ Managed teaching assistant

Summer 2009 &
2010

Department of Mechanical Engineering, Auburn University

MECH 3140 Dynamic Systems & Controls

Instructor

- ◆ Prepared lesson plans, homework, and exams
- ◆ Presented class materials in lectures
- ◆ Coordinated group controller design project

August 2004 – May
2006

Center for Student Success, North Carolina A&T State University

Student Tutor

- ◆ Helped students succeed with core math and science courses
- ◆ Worked with student athletes to improve understanding of homework

Work

May 2005 – August
2005

Daimler Chrysler, Auburn Hills, MI

Interior Engineering Summer Intern

- ◆ Tracked and updated change notifications and communicated progress to the engineering team
- ◆ Represented vehicle interior team at prototype build meetings reporting on build issues and shortages

May 2004 – August
2004

Public Service Electric & Gas, Audubon, NJ
Engineering Intern

- ◆ Responsible for making updates to gas main maps and records
- ◆ Provided other firms with information regarding the locations of gas mains
- ◆ Served as main communication between planning and drafting departments

FUNDED PROPOSALS

Dawkins, J.J., Bevly, D.M (PI), Powell, R. B, and Bishop, R. "Pavement Maintenance Support Applications of IntellidriveSM University of Virginia: DOT Pooled Fund Study, March 2010-February 2011, \$100,000.

PUBLICATIONS

Journals

1. **Dawkins, J.J.**, Bevly, D.M, and Jackson, R.L. "Comparison of Terrain Roughness Characterization Methods", *Journal of Terramechanics (In Review)*.
2. **Dawkins, J.J.**, Bevly, D.M, and Jackson, R.L. "Evaluation of Fractal Terrain Model for Vehicle Dynamic Simulations", *Journal of Terramechanics (Accepted for Publication)*.
3. **Dawkins, J.J.**, Bevly, D.M, and Jackson, R.L. (2012) "Fractal Terrain Generation for Vehicle Simulation", *International Journal of Vehicle Autonomous Systems (In press)*.
4. **Dawkins, J.J.**, and Neu, R.W., (2008) "Influence of Crystallographic Orientation on Energy Dissipation During Sliding", *ASME Journal of Tribology* 130(4).

Conference Proceedings

5. Martin, S.M., **Dawkins, J.J.**, Travis, W.E., and Bevly, D.M., (2010), "Terrain Characterization and Feature Extraction for Automated Convoys", *Proceedings of 2010 ION/GNSS Conference*.
6. Brown, L.S., **Dawkins, J.J.**, Hill, R.S., and Bevly, D.M., (2010), "Road Bank and Grade Estimation on Uneven Terrain for Unmanned Ground Vehicles" *Proceedings of the 2010 ASME Dynamic Systems and Controls Conference*.
7. **Dawkins, J.J.**, Bevly, D.M., and Jackson, R.L. (2009), "Multiscale Terrain Characterization Using Fourier and Wavelet Transforms for Unmanned Ground Vehicles" *Proceedings of the 2009 ASME Dynamic Systems and Controls Conference*.
8. **Dawkins, J.J.**, Shah, S.G, Jackson, R.L., (2009), "A Study of Real Area of Contact for tire/Road Interface", *Proceedings of the 2009 ASME/STLE International Joint Tribology Conference*
9. Neu, R.W., **Dawkins, J.J.**, and Zhang, M., (2008), "Applications of Crystal Plasticity in Contact Mechanics," *Proceedings of 2008 ASME/STLE International Joint Tribology Conference*.
10. **Dawkins, J.J.**, and Neu, R.W., (2007) "Influence of Crystallographic Orientation on Energy Dissipation During Sliding" *Proceedings of 2007 ASME/STLE International Joint Tribology Conference*.

INVITED PRESENTATIONS

1. **Dawkins, J.J.**, (2011) "Pavement Quality Assessment Using Onboard Vehicle Sensors for IntellidriveSM Deployment" Transportation Research Board 90th Annual Meeting. Washington, DC.

2. **Dawkins, J.J.**, (2011) "Investigation of Pavement Maintenance Applications of IntellidriveSM"
Transportation Research Board 90th Annual Meeting. Washington, DC.

PROFESSIONAL DEVELOPMENT

- Aug. 2010 – May 2011 Preparing Future Faculty Fellowship Program
 Auburn University Biggio Center for the Enhancement of Teaching and Learning
- Spring 2011 Seminar in College Teaching: Educational Leadership (EDLD) 8510
 Instructor: Dr. James Groccia Director of AU Biggio Center
- Aug. 2010 – May 2011 Auburn University Biggio Center Professional Development Seminar Series
 Teaching Large Classes Effectively
 Case Studies and Clickers: Promoting Critical Thinking
 Shorten, Sharpen, & Shape up Multiple Choice Test Questions
 Technology in Higher Education
 Using Student Ratings to Improve Teaching Effectiveness
 Promoting Information Literacy in Student Assignments
- Fall 2010 The Professoriate: Educational Leadership (EDLD) 8500
 Understanding Faculty Roles, Work, and Career Paths
 Instructor: Dr. James Groccia Director of AU Biggio Center

MEMBERSHIPS & ORGANIZATIONS

- ◆ American Society of Mechanical Engineers (ASME)
- ◆ Intelligent Transportation Systems of America (ITSA)
- ◆ Transportation Research Board (TRB)
- ◆ Institute of Navigation (ION)
- ◆ National Society of Black Engineers (NSBE)
- ◆ Auburn University Black Graduate and Profession Student Association (BGPSA)

AWARDS & HONORS

- ◆ Auburn University 8th Annual Elements of Mechanical Engineering Graduate Student Poster Session 3rd Place
- ◆ Auburn University Merriwether Fellow
- ◆ Auburn University President's Graduate Opportunity Program (PGOP) Fellow
- ◆ Ford Foundation Pre-Doctoral Fellowship (Honorable Mention)
- ◆ Georgia Institute of Technology Facilitating Academic Careers in Engineering and Science (FACES) Fellow
- ◆ Honors Program North Carolina A&T State University
- ◆ North Carolina A&T Namaskar Award Nominee (Outstanding Engineering Student Award)
- ◆ North Carolina A&T College of Engineering Top Ten Graduate
- ◆ Tau Beta Pi Engineering Honor Society
- ◆ Pi Tau Sigma Mechanical Engineering Honor Society
- ◆ Phi Kappa Phi Academic Honor Society
- ◆ United Negro College Fund PSE&G Scholar