Dexter Watkins

2312 Elliston Place • Apt. 226 • Nashville, Tennessee 37203
Dexter.a.watkins@vanderbilt.edu • (501) 593-2636

EDUCATION

2014 - ... **Vanderbilt University** – Nashville, TN
M.S. Student, Mechanical Engineering GPA: 3.35

2009 - 13 **Vanderbilt University** – Nashville, TN
B.E. Mechanical Engineering, GPA: 3.17
Minors: Computer Science, Chinese (Mandarin)

2011 **Beijing Education Institute, Beijing**
CET Intensive Language Program
Language study, 10 week Mandarin-only pledge for total immersion

RESEARCH AND WORK EXPERIENCE

2014 - … **Vanderbilt University**
Graduate Researcher Supervisor – Dr. A.V. Anilkumar
Multi-domain computational model of a ramjet engine

2014 - … **Vanderbilt University**
Teaching Assistant Supervisor – Dr. Anilkumar, Dr. Valdastri
Teaching and grading Thermodynamics, Fluids, and Instrumentation Labs
Maintaining test beds and updating SOP documents

2014 **Vanderbilt University**
Independent Consultant Customer – Dr. A.V. Anilkumar
Provided design analysis of a sub-sonic ramjet engine
Fabricated and tested an extended combustion chamber
Performed data analysis and reported results

2013-2014 **Northrup-Grumman**
Systems Engineer Supervisor – Mike Steffen
Role: Modeling and Simulation of Missile Systems
Simulated and analyzed global defense systems using in-house software
Heavy use of custom matlab programs for both modeling and analysis
Extensive use of custom kml in Google Earth for data visualization and presentation
Role: Product Test Engineer for Ground-based Midcourse Defense Communications Network (GCN)
Provided engineering and analytical support for development and maintenance of the GCN
Developed test procedures for Verification Objectives
Provided support for both C++ development and hardware drawings for NTE program

2012 **Vanderbilt University**
Student Summer Researcher Supervisor – Dr. Robert J. Webster III
Project: A 3-DOF Robotic Arm For Use In Haptic Interfaces
Designed and constructed all electronics, including emergency stop circuitry
Implementation of PID controller with forward/inverse kinematics for control

2012 **Vanderbilt University**
Student Research Supervisor – Dr. Robert J. Webster III
Assisted in the design of an active cannula robot
Iterative design to meet stringent FDA requirements for use in operation rooms
Assisted in testing and analysis of a duty-cycle controlled steerable needle

TECHNICAL SKILLS

Software**:** OpenFOAM, ANSYS, COMSOL, Creo/Pro E, Solidworks, Matlab, LabVIEW, Mathematica, GME
Equipment**:** Machine Shop (Lathe, Mill, etc.), Laser Cutting, NI Devices, Microprocessors
Fabrication**:** Additive Manufacturing, Fiberglass/Carbon Fiber Layup, Sheet Metal, Woodworking, PCB Fabrication
Programming**:** Matlab, C++, Java, Linux/Unix CLI (Bash),

Design Projects

2015 - … **Vanderbilt Aerospace Design Lab USLI Project –** *Mentor and Instrumentation Engineer*
Overseer for the design of rocket instrumentation including DAQ and control electronics
Mentor for H2O2 thruster design and fabrication as well as development of ground-based testbeds

2014-2015 **Vanderbilt Aerospace Club USLI Project** – *President, Rocket Design Coordinator, Webmaster*
Oversaw the design and construction of the team's USLI competition rocket
Designed and fabricated both a lead-screw driven, sealable payload bay in the rocket's nosecone, and a robotic arm for use in an autonomous, vision-enhanced sample retrieval system

2012-2013 **Vanderbilt University Senior Design** – *Design and Testing of a Biofuel-Based Ramjet Engine*
Design, construction, and evaluation of both a 10ft rocket and multiple ramjet engines
Sole designer of all rocket electronics, including avionics, fuel delivery, and data acquisition
Sole machinist and principle designer of support equipment such as ground-based test stand

2012-2013 **DARPA Competition** – *Model Based Amphibious Racing Challenge (MBARC)*
Designed, modeled, fabricated, and tested 1/5 scale amphibious vehicle
Developed chassis and powertrain assemblies
Constructed Cyber-Physical model to predict performance before fabrication
Second place overall finish behind MIT graduate students at the competition in San Diego

Publications and Presentations

Conference Proceedings

2015 Kumar, P. S., W. Emfinger, A. Kulkarni, G. Karsai, D. Watkins, B. Gasser, C. Ridgewell, and A. Anilkumar, "ROSMOD: A Toolsuite for Modeling, Generating, Deploying, and Managing Distributed Real-time Component-based Software using ROS", Rapid System Prototyping Symposium (ESWEEK), Amsterdam, The Netherlands, 2015.

Presentations/Posters

2013 D. Watkins, R. Thompson, B. Smethills, J. Lee, J. Langford, and F. Corradetti. "Performance Evaluation of Biohybrid-Fueled Ramjet Engines Through Low-Altitude Rocket Flight". Vanderbilt University School of Engineering Senior Design Day

2013 D. Watkins, R. Thompson, B. Smethills, J. Lee, J. Langford, and F. Corradetti. "Rocket-Based Flight Test of a Bio-Hybrid Fueled Ramjet Engine". University Showcase at the SEC Renewable Energy Symposium, 2013

2012 D. Watkins, and R. Lathrop, "A 3-DOF Robotic Arm For Use In Haptic Interfaces". Vanderbilt University Summer Research Program (VUSRP)

2012 H. B. Gilbert, J. Burgner, S. Patil, P. J. Swaney, D. A. Watkins, R. Alterovitz, and R. J. Webster, III, "Toward Planning As Control and Tissue Sparing Needles". In the Pathways to Clinical Needle Steering: Recent Advances and Future Applications Workshop at the IEEE International Conference on Robotics and Automation, 2012.