

Casey St.Fleur

RESEARCH INTERESTS Nonlinear Fluid Structure Interaction, Nonlinear Dynamic, Control System, Autonomous Platforms, Embedded Systems

EDUCATION **Villanova University**, Villanova, PA

Ph.D., Mechanical Engineering, *Expected: Winter 2015*

- Thesis Topic: *Nonlinear Fluid Structure Interaction*
- Advisors: Dr. C. Nataraj, Ph.D

M.S., Mechanical Engineering, May 2010

- Electro-Mechanical Systems Certificate
- Machinery Dynamics Certificate

B.S., Mechanical Engineering, May 2009

- Mechatronics Minor
- Business Minor

RESEARCH EXPERIENCE **Researcher** May 2009 to present
Center for Nonlinear Dynamics & Control, Villanova University

- Created a custom experimental setup to measure and quantify nonlinear elastic bending in fluid mediums. Developed, using Mathworks' Matlab Simulink package, a real time signal processing and control system to monitor and manipulate the experiment. A computational framework was created that models nonlinear fluid structure interaction. Investigated blending high level autonomous algorithms in embedded Linux systems with low level platforms such as the Arduino. Worked on various autonomous platforms including ground robots and aerial vehicles. Mentored several undergraduates, two foreign exchange students from IIT, Delhi and several high school students.

Supervisor: Dr. C. Nataraj, Ph.D

WORK EXPERIENCE **Lockheed Martin** Summer 2007
King of Prussia, PA

- Designed a program used to view, edit, and print internal research and development proposals. This program was implemented throughout the IS&GS of LMC branch and provided the ability for upper management to review the proposals in format they were familiar with. Performed stress testing on an internal website and checked the integrity of the background database of the live site. Integrated the program I created with another program that management wanted to use side by side. Took the initiative taken to streamline the process by recoding both tools to directly pull the information from the same database. Implemented a method for accessing and distributing the information stored in the database.

Supervisor: Angela Wrubel

Lockheed Martin

Summer 2008

Gaithersburg, MD

- Used CAD software to model the mechanical packaging of server racks in various configurations. These drawings were used in helping determine server placement within confirmed spaces. Analyzed the heat flow in a server room using computational fluid dynamics to determine the best design of a ventilation system. This ventilation system helped mitigate heat flow problems within the server room. Created the technical drawings of said ventilation system.

Supervisor: Daniel Claiborne

Lockheed Martin

Summer 2009

Gaithersburg, MD

- Worked as part of a consulting team hired by various government agency for on-site consulting. We traveled to places such as United State Joint Force Command and Naval Air Weapons Station China Lake. I extracted feedback from military personnel about our products to gain insight of their limitations. I modeled the servers and power electronic systems in CAD software for future mass production use. Collaborated with a colonel to design and price a unique wearable computer to be used by field doctors.

Supervisor: Jordan Thomas

CONSULTING
WORK

American Aerospace

March 2011

- Performed vibration frequency analysis and designed a mass damper system to minimize unwanted vibration in the chassis of a long endurance unmanned aircraft improving video quality.

Supervisor David Yoel

LEADERSHIP
ROLES AND
ACTIVITIES**Resident Assistance**

August 2008 - May 2010

Villanova University, PA

- I was responsible for supporting incoming freshmen and sophomore as they transition to college life by fostering a sense of community. In order to accomplish this I got to know every one of my residents and then planned monthly activities that were both entertaining and educational. I was also tasked with enforcing university policy and conflict resolution for approximately 45 students.

Supervisor: Tom DeMarco

Activities

CEER Graduate Engineering Club

- Founding memeber
 - * One of ten students selected by the college of engineering department chairs to form the new graduate club
 - * This club was to be a liason betwven the graduate engineering student body and the university
 - * Tasked with goal of fostering social, professional and academic development among graduate engineering students

Association for Unmanned Vehicle Systems International - Keystone Chapter

- Helped organize the AUVSI Keystone Chapter 2014 Symposium
 - * In charge of email distribution
 - * Responsible for various presentation equipments used during the symposium
 - * Aided with various logistically issues that arise the day of the symposium

Senior Thesis

- Designed and built a computer controlled hydraulics transmission system to be used in a motorcycle.

Alternative Energy Vehicle Club (Solar Car)

- Vice President/Treasurer

National Leadership Club

- Leadership club were invitation were issued based on academic selection

Professional Development Program

- College of Engineering extra academic activity

American Society of Mechanical Engineers

National Society of Black Engineers

Association for Unmanned Vehicle Systems International

TEACHING
EXPERIENCE

Teaching Assistant

Fall 2009

- ME 2100 Statics
Responsible for grading the homework and administering the tests for sophomores for the statics class.

Instructor

Spring 2010

- ME 3900 ME Lab II
Taught the Beam Deflection and the Material Hardness lab to juniors. I was also responsible for grading lab reports and evaluating group presentations.

COMPUTER
EXPERTISE

Programming Languages

C++

- Proficient using C++ 11/14 in the Windows and Linux environments

Matlab

- I have programmed multiple programs and scripts using Matlab and various toolboxes such as Simulink, Control System Toolbox, Embedded Coder, Real Time Target, Computer Vision, Optimization and Data Acquisition Toolbox

AVR Assembly

- Experienced writing assembly level code for Atmega AVR processors used in timing sensitive applications.

HTML

- I have designed various sites using HTML code and have used CSS and Javascript code for formatting purposes. Code editing software I have used include Dreamweaver and Visual Studio

LaTeX

- I have created article, reports, and presentations using Latex.

Embedded System

- Experienced building embedded Linux operating systems using both the OpenEmbedded and Yocto framework. Proficient when it comes modifying, editing and creating Bitbake recipes.
- Built robotic platforms around various hardware including Gumstix, Beaglebone, Arduino and Pandaboard

Microsoft Office Suite

- Experience using the Microsoft Office suite in particular Word, Excel, Power Point, Outlook, Project, Access and Publisher.

Maple

Mathematica

UNIX shell scripting

Python

Solidworks

AWARDS

Dean's Tuition Scholarship

- Scholarship through the College of Engineering that cover a year's tuition.

Edward Reese Fellows Scholarship

- Annual Scholarship issued by Lockheed Martin

Dean's List

- Awarded every semester to students based on academic performance

REFERENCES

Dr. C. Nataraj, Ph.D

Mr. and Mrs. Robert F. Moritz, Sr., Endowed Chair

Villanova University

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