Derek J. Black

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EDUCATION

Kansas State University Manhattan, KS
Master of Science, M.Sc. May 2017
Major: Engineering
Focus: Control Theory, Mechatronics & Software Engineering
Thesis: Development & Feasibility of Open Source Hardware/Software in Control Applications

Kansas State University Manhattan, KS
Bachelor of Science, B.S. December 2014
Major: Mechanical Engineering

TECHNICAL COMPETENCIES

- Adobe Suites: Photoshop, Illustrator, Muse
- Computer Aided Design: SolidWorks, AutoCAD, KiCAD, FEA
- Operating Systems: Windows, Linux, OSX
- Microsoft Office: Word, Excel, PowerPoint
- Programming Languages: Python, C/C++, C#, VBA, Fortran
- Other: MATLAB, Bash, LaTeX, SSH, JSON, HTML, CSS
- Simulation: Simulink, LabVIEW
- Projects: github.com/black3037, derekjblack.com

COURSEWORK & SKILLS

Control Theory:

- Optimal Control Theory, Computer Control of Electromechanical Systems (Digital Control), Modern Control Theory

Programming, Microcontrollers, and Mathematics:

- Development of Computer Applications, Mechatronics, Microcomputer System Design, Engineering Analysis

Self-Development:

- Data Structures & Algorithms, Kalman Filtering, ARM Programming, Machine Learning

PROFESSIONAL EXPERIENCE

Lab Instructor (Control of Mechanical Systems) *August 2016—Present*
Kansas State University *Manhattan, KS*

- Prepared 45 min. lab lectures for a class size of 30+ students
- Lead exam review sessions by creating practice exams and lectures to aid students in upcoming examinations
- Provided student feedback on laboratory hardware/software and how to perform appropriate practical analysis of experiments on the laboratory hardware
- Diagnosed problems that would arise on laboratory hardware, such as fixing an output offset problem caused by inappropriately selected resistor values for a custom printed circuit board
- Held office hours and graded laboratory reports/homework for a class of 90+ students

Graduate Teaching Assistant (Fluid Mechanics) *August 2015—May 2016*
Kansas State University *Manhattan, KS*

- Lead multiple hour long help sessions per week to aid students in the material covered in lecture
- Graded homework for a class of 120+ students
- Assisted Dr. Wanklyn in various teaching responsibilities

Material Scientist and Technician Consultant *March—August 2015*
Terracon – Consulting Engineers and Scientists *Manhattan, KS*

- Projects consulted on: KSU Engineering Complex, KSU Chilled Water Expansion, KSU East Memorial Stadium, Vanier Football Complex, College of Business Administration
- Primary consultant for the KSU Chilled Water Expansion. Consulted multiple on-site engineers and contractors about engineering specifications for material strength, water content and dry & wet densities of various geotechnical soils, concrete, etc.
- Perform lab analysis of geotechnical soils per ASTM standards to provide appropriate numbers to be used in foundation testing
- Certified to use a nuclear density gage

PROJECTS

Senior Design Project *January 2013—December 2014*
Heartspring *Kansas State University*

- Part of a design team that helped build an adjustable platform that housed a 60-inch touch screen for children with special needs
- Design allowed access to children who are bedridden and in wheelchairs by a click of a button
- The adjustable platform could be raised, lowered, rotated, and locked in place for safety purposes

GUI Development for MotorLab *August 2016—December 2016*
Dr. Schinstock *Kansas State University*

- Converted an existing MATLAB GUI to python that allows students to interact with lab hardware (MotorLab)
- The PyQt4 framework and a Model View Controller methodology was employed to create the new GUI
- Allowed serial communication to and from an ST Discovery Board microcontroller and PC