Jacob Senecal

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Education

Montana State University
M.S. Computer Science, GPA 3.97 // Aug 2017 – June 2019 (expected graduation)
B.S. Mechanical Engineering, GPA 3.95 // 2013 – 2016

Experience

Graduate Research Assistant – **Numerical Intelligent Systems Laboratory**
Aug 2017 – Present

- Technical lead assessing feasibility of applying machine learning to monitor produce for Intel Corporation
- Developing predictive analytics using hyperspectral imaging and machine learning
- Building data pipeline to ingest hundreds of gigabytes of hyperspectral images

Software Engineer – **Blackmore Sensors & Analytics**
June – Aug 2018

- Built production software to automate LiDAR calibration on automotive systems
- Prepared technology demonstrations for clients and media (see article in WIRED Magazine, www.wired.com/story/blackmore-doppler-lidar-self-driving-cars/)
- Implemented an extended Kalman filter for an embedded navigation system
- Designed a custom machine learning model to extract features from large point cloud datasets

R&D Engineer – **Los Alamos National Laboratory**
Jan – Aug 2017

- Created laser-ultrasound diagnostic system for $60,000 lower cost than previously used system
- Produced data analysis tools for automated feature detection within large datasets from real time manufacturing operations

Mechanical Engineer – **Los Alamos National Laboratory**
June – Aug 2016

- Developed material damage model to predict failure in qualification testing
- Performed data acquisition, and signal processing to validate the new model

Research Assistant – **Fluids & Computations Laboratory**
2015 – 2016

- Analyzed performance of new algorithms simulating multiphase flow problems
- Programmed 3D flow solver with uncertainty quantification

Skills

Programming Languages: Python, Java, C++, MatLab, SQL, JavaScript, HTML, CSS, LabVIEW
Libraries: Tensorflow, PyTorch, Scikit-Learn
OS: Linux, MacOS, Windows

Publications

Senecal, J., Walton, N., Logan, R., Scherrer, B., Peerlinck, A., Sheppard J., Shaw, J. (2018) "Using Hyperspectral Imaging with Machine Learning to Monitor Grocery Store Produce", Optical Science and Engineering Conference, Bozeman, MT.

Owkes, M., Cauble, E., **Senecal, J**., & Currie, R. A. (2018). Importance of curvature evaluation scale for predictive simulations of dynamic gas–liquid interfaces. Journal of Computational Physics, 365, 37-55. doi:10.1016/j.jcp.2018.03.018

Senecal, J., Jarque, A., Flynn, E. (2017). "Compact Laser Ultrasound System for Non-Destructive Evaluation", 11th Meeting of the International Workshop on Structural Health Monitoring, Palo Alto, CA.

Prisbrey, M., **Senecal, J**., Sethi, M., Haynes, C., Taylor, S. (2017). "Equating Severity in Qualification Testing", 35th Meeting of the International Modal Analysis Conference, Garden Grove, CA.

Senecal, J., Owkes, M. (2016). "Optimal Scale for Curvature Calculations in Multi-Phase Flows", 69th Meeting of the APS Division of Fluid Dynamics, Portland, OR.

Activities

AUVSI Robosub Competition

- Invented robotic arm capable of opening doors and picking up objects
- Integrated design with computer vision and electrical system
- Developing object detection system

Study Abroad

Chonbuk National University
May 2017 // Jeonju, South Korea

- Studied cyber-physical systems and structural health monitoring techniques

Service & Leadership

Vice President – **Pi Tau Sigma Engineering Honor Society**
Jan – Dec 2016 // Montana State University

- Organized engineering outreach events within the local community

Engineering Ambassador
2015 – 2016 // Montana State University

- Elected by Montana State faculty to represent the College of Engineering to potential donors, advisory board members, and prospective students

Engineers Without Borders
2014 – 2016 // Kwhisero, Kenya

- Constructed water supply and filtration system for school of 500 students