Jacob Senecal

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Education

2017 - Present **MS Computer Science,** *Montana State University – 3.97 GPA*
Expected Graduation June 2019

2013 - 2016 **BS Mechanical Engineering,** *Montana State University – 3.95 GPA*

Experience

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

- Developing predictive analytics using hyperspectral imaging and machine learning
- Investigating neural network architectures for high dimensional imagery

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

- 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/)
- Designed and implemented a custom machine learning model to extract features from large point cloud datasets

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

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

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

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

2015 – 2016 **Research Assistant,** *Fluids and Computations Laboratory*

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

2014 - 2016 **Systems Engineer / Site Foreman,** *Engineers Without Borders*

- Constructed water supply and filtration system for school of 500 students
- Served in Kenya as site foreman while project was under construction
- Solved logistics problems on the ground in Kenya

Skills

Programming – Python, Java, C++, MatLab, SQL, LabVIEW
Machine Learning – Tensorflow, PyTorch, Scikit-Learn
Web Development – HTML, CSS, JavaScript
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

Jan – Dec, 2016 **AUVSI Robosub Competition**

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

Study Abroad

May 2017 **Chonbuk National University,** *Jeonju, South Korea*

- Studied cyber-physical systems and structural health monitoring techniques

Service & Leadership

Jan – Dec, 2016 **Pi Tau Sigma Engineering Honor Society**, *Vice President*

- Organized engineering outreach events within the local community

2015 – 2016 **Engineering Ambassador**

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