Jacob Senecal

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Education

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

Experience

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

- Assessing feasibility of applying machine learning to monitor produce (fruits, vegetables) for Intel Corporation
- Developing predictive analytics using hyperspectral imaging and machine learning
- Built pipeline to clean, format, and ingest data for model training

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

- Implementing algorithms for real time segmentation of streaming point cloud data
- Built production software to automate LiDAR calibration on automotive systems
- Designed a custom machine learning model to extract features from large point cloud datasets
- Prepared technology demonstrations for clients and media (see article in WIRED Magazine, www.wired.com/story/blackmore-doppler-lidar-self-driving-cars/)

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
- Converted 2D multiphase Fortran-90 code to 3D
- Programmed 3D incompressible flow solver in MatLab

Skills

Programming Languages: Python, Java, C++, MatLab, SQL, JavaScript, HTML, CSS, Fortran-90, LabVIEW
Libraries: Tensorflow, PyTorch, Scikit-Learn
OS: Linux, MacOS, Windows
Frameworks & Tools: Git, Flask
Miscellaneous: Held recent “L” security clearance from the Department of Energy

Publications

Senecal, J., Vannoy, T., Strnadova-Neeley, V., (submitted) "Improved Subspace K-Means Performance via a Randomized Matrix Decomposition." *Proceedings of the 42nd Annual International ACM SIGIR Conference on Research and Development in Information Retrieval. ACM.*

Senecal, J., Sheppard, J., (submitted) "Efficient Convolutional Neural Networks for Multi-Spectral Image Classification", *2019 International Joint Conference on Neural Networks*, Budapest, Hungary.

Logan, R., **Senecal, J**., Walton, N., Scherrer, B., Peerlinck, A., Sheppard J., Shaw, J. (2018) "Using Hyperspectral Imaging and 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.

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 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

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