

SKILLS

Machine Learning:

- Regression
- Support Vector Machines
- Random Forests
- Gradient Boosting
- KNN Algorithms
- Artificial Neural Nets (ANN)
- Convolutional Neural Nets (CNN)

Programming:

- Python (Data Science Stack)
 - Numpy
 - Sklearn
 - Tensorflow
 - Matplotlib
- SQL (MySQL)
- Matlab
- R
- C/C++

Other:

- Statistical Analysis
- Linux (Ubuntu)
- Experimental Design
- Microsoft Office
- Lab Work
- CAD design
- FEM simulation
- Additive manufacturing

WORK EXPERIENCE

Post-Doctoral Researcher

TF Health Corporation

May 2017 – Present

Tempe, AZ

- Developed a CNN (Convolutional Neural Network) based quality control system using Python (Keras/Tensorflow)
- Developed a simple GUI and script to take a set of data, generate a multivariate calibration, give relevant statistical analysis, and generate a QR code image of calibration parameters using Python
- Created a baseline tracking algorithm for accurate and reliable flow measurement of breath to negate sensor interference
- Performed regular experimental design and statistical analysis for medical device development
- Applied statistical analysis methods to develop a multiple regression method for sensor calibration in Python
- Modeled, built, and validated an improved low-cost flow meter using computational fluid dynamics

Graduate Research Assistant

Arizona State University

May 2013 – May 2017

Tempe, AZ

- Developed and scripted a signal processing algorithm for colorimetric CO2 detection in Matlab
- Optimized designs, algorithms, and production processes to minimize variance and error in Matlab
- Characterized sensor coatings and other related materials

Data Science Intern

TF Health Corporation

May 2012 – May 2013

Tempe, AZ

- Built the sensor coating production process still used for the flagship product
- Modeled and wrote the sensing algorithms still used in the current flagship product in Matlab

PERSONAL PROJECTS

- **Journal Scraping:** Scraped Nature in order to see trends in word usage over time. Found several interesting trends (see dbridgem.github.io for more detail)
- **Animated Bar Graph Generator:** A script to generate an animated bar graph based on a simple csv input. Code is available on Github.
- **Kaggle:** Ranked 114 of 4540 (top 3%) in the LANL Earthquake Prediction competition.

EDUCATION

Ph.D. Chemical Engineering

Arizona State University

- 8 Publications (5 primary, 3 secondary)
- 5 Travel grant awards and 1 fellowship award

May 2017

Tempe, AZ

BSE. Chemical Engineering

Arizona State University

- President of the Chem-E-Car Club in 2012-2013

May 2013

Tempe, AZ

PUBLICATIONS

- Liu, N. Y., Deng, Y., Tsow, F., **Bridgeman, D.**, Xian, X., Dean, J. J., ... & Forzani, E. (2018). Evaluation of a Thermal-Based Flow Meter for Assessment of Mobile Resting Metabolic Rate Measures. *Journal of Sensors*, 2018.
- **Bridgeman, D.**, Tsow, F., Xian, X., Chang, Q., Liu, Y., & Forzani, E. (2017). Thermochemical Humidity Detection in Harsh or Non-Steady Environments. *Sensors*, 17(6), 1196.
- **Bridgeman, D.**, Tsow, F., Xian, X., & Forzani, E. (2015). A new differential pressure flow meter for measurement of human breath flow: Simulation and experimental investigation. *AIChE Journal*.
- Xian, X., Quach, A., **Bridgeman, D.**, Tsow, F., & Forzani, E. (2015). Personalized Indirect Calorimeter for Energy Expenditure (EE) Measurement. *Glob J Obes Diabetes Metab Syndr*.
- **Bridgeman, D.**, Corral, J., Quach, A., Xian, X., & Forzani, E. (2014). Colorimetric humidity sensor based on liquid composite materials for the monitoring of food and pharmaceuticals. *Langmuir*, 30(35), 10785-10791.
- Zhao, D., Xian, X., Terrera, M., Krishnan, R., Miller, D., **Bridgeman, D.**, ... & Tao, N. (2014). A pocket-sized metabolic analyzer for assessment of resting energy expenditure. *Clinical Nutrition*, 33(2), 341-347.
- **D. Bridgeman**, D. Zhao, F. Tsow, X.J. Xian, and E. Forzani, "Chemical Bio-Sensing with Mobile Technologies - A Non-Invasive and Inexpensive Capnography Device for the Monitoring of COPD and Other Pulmonary Diseases", Proceedings of IEEE Engineering in Medicine and Biology Society (EMBS), 2015. (Conference Proceeding)
- **Bridgeman, D.**, Zhao, D., Tsow, F., Xian, X. J., & Forzani, E. S. (2014, October). A non-invasive and inexpensive capnography device for the monitoring of COPD and other pulmonary diseases. In *Healthcare Innovation Conference (HIC), 2014 IEEE* (pp. 1-4). IEEE. (Conference Proceeding)