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Experience

- **Computer Vision for Activity Recognition in Swine** Iowa State University
  Graduate Research Assistant *June 2021 - Present*
  - **Object Detection using Neural Networks**: Utilized a PyTorch implementation of YOLOv3 to detect piglets (mAP = 0.91). Utilized a Tensorflow implementation of a Resnet34 classification model and a YOLOv5 object detection model to strategize pose estimation. mAP = 0.89 and 0.88.
  - **Augmented Reality**: Developing a program to superimpose a segmented pig image onto a rendered pig to estimate body condition and fitness of the animal, from only one side view.
- **Estimating Fitness of Swine using Computer Vision** Iowa State University
  Graduate Research Assistant *June 2020 - Present*
  - **Biomechanics**: Built a program on Python (OpenCV) to objectively calculate body measurements of 100 pigs.
  - **Optimized Phenotyping**: This algorithm was found to have higher accuracy (0.97), precision (0.99), and objectivity than data collected from manual body measurements.
- **Thermal Characterization of Heat Treated Swine** Iowa State University
  Graduate Research Assistant *June 2020 - Present*
  - **Time Series Analysis:**: Directed a team of undergraduates on bimonthly trips to an off campus swine research site. Worked with the U.S. Department of Agriculture (USDA) on characterizing temperature to control disease outbreaks of African Swine Fever in R (dplyr, emmeans, lme4, ggplot2)
- **Recycling Inedible Plant Biomass** National Aeronautics and Space Administration (NASA)
  Team Leader *April 2016 - May 2017*
  - **Signal Processing**: Represented the team at Kennedy's Space Station to present findings on the recyclability of inedible biomass in microgravity using data collected from my data acquisition system.

Technical Projects

- **Apple Watch Time Series Analysis**: Visualization of cardiovascular activity and body fat percent changes over a year, using the Apple Watch API on Python (Seaborn, Pandas, BeautifulSoup, matplotlib, scikit-learn). Forecasted average number of steps for the rest of 2021 using ARIMA.
- **Automated Nike Shoe Color Palette**: Implemented a sports fashion program on Python to data mine a color palette of every shoe on the website.

Education

- **Iowa State University** Ames, IA
  Doctor of Philosophy (Ph.D.) in Agricultural Engineering *June 2020 – December 2022*
- **Iowa State University** Ames, IA
  Masters in Genetics and Genomics *August 2018 – June 2020*
- **The Ohio State University** Columbus, OH
  Bachelor of Science in Bioengineering *August 2012 – June 2018*

Relevant Coursework:

Data Science Programming, Introduction to Machine Learning, Statistical Algorithms for Computer Vision, Database Management (SQL), Software Tools for Big Data Analysis (UNIX, Hive, Tableau).

Publications

- **Effect of a Genetic Marker for the GBP5 Gene on Resilience to a Polymicrobial Natural Disease Challenge in Pigs**: https://doi.org/10.1016/j.livsci.2021.104399
- **An Introduction to Automated Visual Sensemaking for Animal Production Systems**: hhttps://elibrary.asabe.org/abstract.asp?aid=52179
- **Proliferation of Peripheral Blood Mononuclear Cells From Healthy Piglets After Mitogen Stimulation as Indicators of Disease Resilience**: https://doi.org/10.1093/jas/skab084