Ryan Jeon (Ph.D. Student)

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Experience

- **NASA: Recycling Inedible Plant Biomass** — National Aeronautics and Space Administration (NASA)
  Team Leader — *April 2016 - May 2017*
  - **Signal Processing and Modeling**: 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.
- **USDA: Thermal Characterization of Heat Treated Swine** — Iowa State University
  Graduate Research Assistant — *June 2020 - Present*
  - **Time Series Analysis**: Collaborated 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)
- **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, precision (0.99), and objectivity than data collected from manual body measurements.

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 Piglet Wellbeing Dashboard**: Designed an automated HVAC control dashboard for regulating ideal piglet temperatures on C++ using a PixyCam sensor and various different environmental sensors to prevent heat stress by holistically regulating the overall condition of the piglet.

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**: https://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

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*