# Shaan Luthra

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## Experience

**PrecisionHawk** Raleigh, NC
*Data Scientist* Jun 2022 - Present

- Built Methane Gas Leak Detector pipeline including preprocessing, feature extraction, model architecture, and inference. Created Video Stabilization model to correct drone camera jitters and movements. Leveraged Optical Flow feature matching with Affine and Homography transforms to achieve precise video alignment.
- Refactored core Object Detection Deep Learning Model (YOLO architecture, PyTorch) and reintegrated all dependencies after 1+ year leading to an mAP increase of 5%. Integrated Bayesian hyperparameter optimization to updated model.
- Implemented Distributed Data caching using custom Samplers enabling parallel GPU computing. Leads to substantial reduction of computational expenses for model training.
- Developed Aerial-based oriented bounding box modeling for Object Detection Model, leading to an increase of 8% in Intersection over Union (IOU).

**Hewlett Packard Enterprise** Seattle, WA
*Data Science Intern* May 2021 - Aug 2021

- Developed a full model pipeline that took unstructured log messages and leveraged Hierarchical Clustering based template extraction to transform 4 million unique log messages into 84 templates.
- Increased efficiency of support engineers identifying harmful log messages by over 30% in weekly ticket completions.
- Implemented an Unsupervised anomaly detection algorithm to identify harmful log messages based on auto-embeddings of extracted templates.

**Automatic Child Speech Recognition Research, Purdue University** West Lafayette, IN
*Machine Learning Researcher* Aug 2020 - May 2022

- Key leader and contributor in all phases of project life-cycle including data preprocessing, augmentation, feature selection, modeling, validation, and inference.
- Identified and implemented methods like noise reduction, filter transformations, spectrograms, Mel-Frequency Cepstral Coefficient features, and more in order to build out signal processing infrastructure.
- Led Deep Learning team of 4 researchers and built a Deep Convolutional-LSTM Model with Tensorflow achieving a phonetic accuracy of 87%.

**Safkan Health** Seattle, WA
*Machine Learning Engineer* Oct 2020 - Feb 2021

- Developed Deep-CNN model to detect the presence of tympanic membrane infections with 90% accuracy using Tensorflow for the Safkan OtoSet.
- Responsible for the full model pipeline including data acquisition, preprocessing, augmentation, inference, and validation.

## Education

**Purdue University** West Lafayette, IN
B.S. Data Science Aug 2018 - May 2022
*Department of Computer Science*

## Skills

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|---|---|
| Languages: | Python, C++, Java, SQL, R, C# |
| Libraries: | PyTorch, Tensorflow, Scikit-Learn, Numpy, Scipy, OpenCV, Pandas |
| Tools/Services: | AWS, GCP, WandB, Spark, Nvidia Cuda/Nccl |

## Awards

**Presidential Volunteer Service Award**

2015, 2016

Put on year-round community service events, performed charitable work, planned and executed several summer camps totaling 220+ volunteer hours.