# SONU DILEEP

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## EDUCATION

**Master of Science in Computer Engineering** **August 2018 - Present**
Colorado State University, Fort Collins
**Bachelor of Technology in Electronics and Communication Engineering** **July 2013 - May 2017**
Amrita Vishwa Vidyapeetham, Amrita University
**Relevant Coursework**: Machine Learning, Image Computation, Machine learning & Adaptive Systems, Digital Image Processing, Introduction to Computer Graphics, Optimization Methods, Robotic Programming, Big Data

## SKILLS

- **Technical Skills**: Deep Learning, 2D/3D Object Detection & Tracking, Segmentation, Feature Detection, 3-D Reconstruction, Structure from Motion, SLAM, 3-D Face Reconstruction, GANs, Probabilistic Modeling
- **Programming Language:** Python, C++, MATLAB, Scala
- **Libraries**: OpenCV, ROS, Keras, PyTorch, TensorFlow, Numpy, Scipy, Scikit-learn, Pandas, Matplotlib, Apache Spark, Hadoop
- **Other Skills:** Arduino, Raspberry Pi, PyQt, QGIS, RVIZ, Git, Unreal Engine
- **Professional Skills:** Creativity, Critical Thinking, Problem Solving, Team Player

## PROFESSIONAL EXPERIENCE

**Graduate Researcher, CSU Energy Institute, Fort Collins, CO** **01/2020 - Present**
*Computer vision for automated identification of well pad features from satellite imagery*
- Engineered an automated well pad and equipment detection model using CNNs for methane emission studies.
- Developed a plugin for easy annotation of satellite imagery using PyQt and QGIS.
- Achieved an average well pad and equipment detection accuracy of 97 % in DJ Basin, Colorado.
- Created a database of well pad locations and features in DJ Basin using the model.

**Research Engineer, Humanitarian Technologies (HuT) Lab, India** **05/2017 - 12/2017**
*Hand Gesture Based Wheelchair navigation*
- Responsible for writing codes for wheelchair navigation using Hand Gestures.
- Combined data from multiple sensors for safe navigation of wheelchair.
- Worked in the development of project “SLAM Based Autonomous Wheelchair Navigation”.

## RELATED PROJECTS

**Face Authentication using One-Shot Learning.**
- Developed a Real-time Face Verification model using Siamese network to verify the person in frame.
- Achieved an accuracy of 96.7% on AR dataset using FaceNet CNN architecture.

**Ray tracer program from scratch**
- Implemented a ray tracer program in C++ which could render Photo-realistic images of 3-D models using Perspective Projection and Camera modeling.

**Detecting most popular topics from live Twitter message stream**
- Implemented a model using Apache Storm and Apache Zookeeper to detect the most popular topics from live twitter message streams using lossy county algorithm.

**Manifold Learning for Image Compression and Classification**
- Applied 3 manifold learning algorithms, Locally Linear Embedding, Multidimensional scaling, and Isomap on Fruits-365 dataset to reduce the dimensionality of images.
- Improved the classification speed by 30 times using KNN, while maintaining a higher validation accuracy.

**3-D model Reconstruction from a single perspective Image**
- Developed a model based on the paper “Single View Metrology” to calculate the 3D affine measurements from a single perspective view of an image using vanishing points and texture mapping.