Project Details

(To be filled by the student at the end of Week 1 – after discussion with PS-1 Faculty & Industry Mentor)

Title of Project:

Snow Level change Detection using Image Processing and Machine Learning.

Mentor Details

Ms. Vinita Daiya
Scientist Officer at IGCAR
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Skill Set Requirements

Machine Learning Algorithms required for Level Detection.
Software implementation of developed Algorithm using OpenCV library (open source)- in Python OpenCV/MATLAB/SCILAB.

Project Outcomes

Machine Learning based Image Processing techniques used for snow level detection.
Getting comfortable with using OpenCV library.
Algorithm Development.

Project Description

This Project can be useful for the WSN-Avalanche Project which uses wireless sensor network (WSN) and Image Processing for the detection of Avalanche. Low power cameras are installed on site for snow level monitoring. This project aims at extracting the snow level from the reference pole mounted in snow covered area. Various Image Processing techniques using Machine Learning Algorithms can be used for snow level detection. Software implementation in MATLAB/SCILAB/Python OpenCV environment to extract the snow level from multiple images is the main purpose of the project.

Project Work Plan

(Weekly Plan)

Week 1: Getting in contact with the mentor and teammates. Studying basic information regarding the Project. Literature survey on Image Processing for level detection.

Week 2: Studying the Machine Learning Algorithms and Development of the Algorithm for simpler cases.

Week 3: Algorithm Development and Implementation on simple examples. Algorithm performance with lab examples.

Week 4: Revised Algorithm Development for lab images and performance (software implementation) with lab images.

Week 5: Algorithm Performance using actual images and Algorithm development for actual images (field images).

Week 6: Revised Algorithm performance with actual images and Algorithm development if required.

Major Project Milestones

- Understanding various Image Processing techniques and getting an overall idea about the project.
- Algorithm Performance with simple images.
- Algorithm Performance with lab images.
- Algorithm Development and Performance with actual images.