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IIT Guwahati

To,
Whomever it concerns:

I am writing this letter to certify that Mr. Anshuman Mondal has worked on an internship with me from September 2024 to March 2025. Anshuman is currently a B.Tech. student at the EEE Department in IIT Guwahati, in which I am a Professor.

Anshuman's project was on image-based tea leaf classification. The really challenging part was the image pre-processing that was required to remove shadows and other artifacts so that the data set could be used for training a classifier. A team from a tea research laboratory had provided to me the data set containing several thousand images for a total 30 distinct cultivars (classes, in image classification speak). A previous intern was able to get good classification results from a set of "clean image data" that were collected using a scanner, but not from the "noisy" dataset that were collected in the field. The main bottleneck was the presence of shadows. The task I assigned to Anshuman was. To develop an automated method for removing shadows and other artifacts from the large data set so that CNN-type classifiers can be trained.

Anshuman was able to come up with an idea and its implementation that was successful in removing shadows from nearly the entire dataset of leaf images. The way he did it was quite interesting too; as he cleverly used online resources and open-source image processing methods – some of which he did not even understand fully – to solve his problem. He was able to figure out, on his own, what was important and what was not, and where he could resort to heuristics and where it was unwise to do so.

This part of the project was ultimately not successful since the raw image data did not have enough diversity, so the inference on images captured with distinct cameras produced extremely poor results. This is the point where Anshuman exited the project as well. However, he did contribute significantly to the development of the image preprocessing method.

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