Self-Introduction

Atharva Gupta
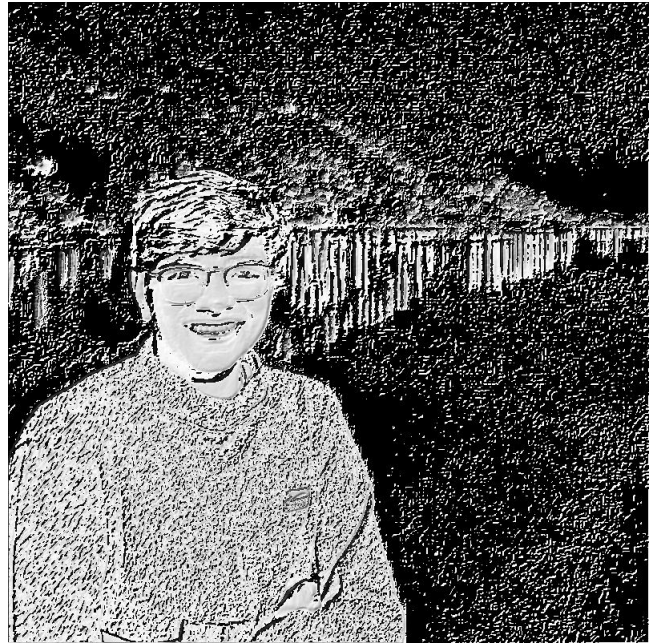Arizona State University
Tempe, AZ
agupt344@asu.edu

Figure 1. Side-by-side comparison: (a) Unprocessed Image, (b) Processed Image.

Image Processing: Sobel Filtering

To generate the processed version of my photo, I applied a Sobel edge detector using PyTorch. The grayscale image was convolved with 3×3 Sobel kernels in the horizontal and vertical directions to capture intensity changes. The gradient magnitudes were then combined by adding them (instead of taking the sum of squares like done for traditional edge maps)and normalized, highlighting boundaries and prominent features in the image. This small tweak to the standard edge detection method produced a visually pleasing effect.

Background

My name is Atharva Gupta, and I am a 4+1 MS student majoring in Computer Science at Arizona State University. Over the past few years, I have worked across domains such as traditional software development, applied statistics, and deep learning. Alongside coursework, I work part-time as a Research Engineer at the School of Sustainability Engineering and Built Environments (SSEBE), where I am currently building models to predict soil carbon levels using satellite imagery.

Knowledge of Image Analysis

My knowledge of image processing so far has been mostly practical, where I often reuse existing implementations to suit my use cases. While I have interacted with image data in projects, I have yet to build a systematic foundation in designing image analysis pipelines or biomedical imaging applications.

Why I Am Taking This Course

I decided to take this course because I want to develop stronger fundamentals in image analysis and gain hands-on experience in vision-based deep learning models. My goal is to learn how to design training pipelines from scratch and cultivate a better intuition for systematically approaching new image-related problems.

Career Objectives

My current career objective is driven by my will to keep learning about frontier topics in Data Science and Software Development. In the near term, I am interested in gaining industry experience to refine my skills and deepen my expertise. In the long term, I aspire to pursue a doctoral degree and contribute to research at the intersection of machine learning, vision, and sustainability.