

# Feasibility Report

## Problem Statement

A computer vision application that captures a video from a camera, detects the edges of objects and project it back onto the objects.

## Proposed Solutions

### 1. Canny Edge Detection

This solution uses Bilateral Filtering and Canny Edge Detection to detected edges of object from the video. Unfortunately for this problem, the upper and lower thresholds have to be set manually.

### 2. HED

Holistically-nested edge detection (HED), performs edge detection by means of a deep learning model that leverages fully convolutional neural networks and deeply-supervised nets. HED automatically learns rich hierarchical representations for the thresholds, unlike Canny Edge Detection.

### 3. DexiNed

DexiNed is a Dense Extreme Inception Network for Edge Detection. It is one of the cutting-edge AI models used in edge detection.

## Hardware Specifications:


**CPU:** Intel® Core™ i7-7700HQ CPU @ 2.80 GHz

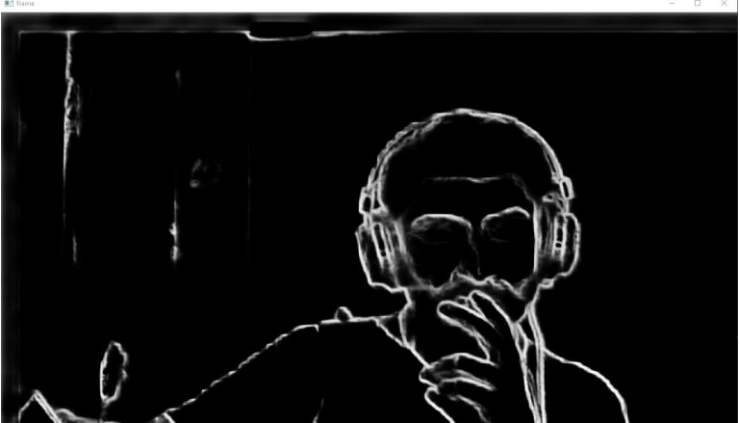
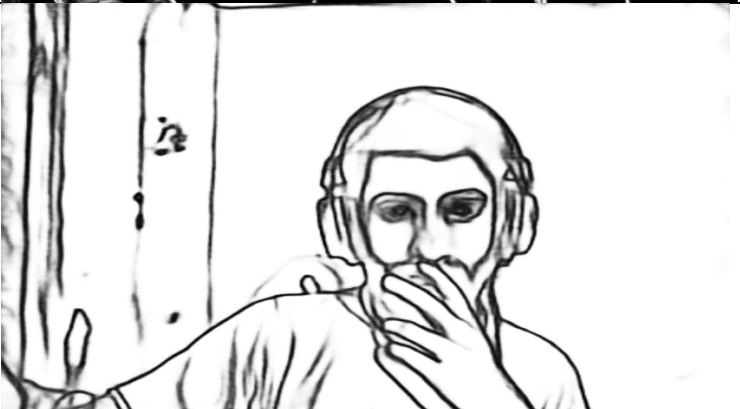
**Memory:** 16 GB

**GPU:** NVIDIA Quadro M1200 (11GB GPU Memory)

**Camera Resolution:** 1280 x 720

## Benchmark

Solution Name	FPS Achieved	Output Example
Canny Edge Detection (No GPU)	60 FPS (Maximum Refresh rate of display unit)	

HED (No GPU)	0.33 FPS	
DexiNed (GPU Accelerated)	1 FPS	

## Conclusion

With the disastrous drop in FPS with the last two solutions, the development team proceeded with the first solution.