**CAP5415**

**Computer Vision**

**Fall 2022**

**Homework 3**

**Questions 1:**

The main difference between Prewitt and Sobel edge detector is the way how we compute the derivative during edge detection.

True/False

**False: it is the smoothing filter**

**Questions 2:**

In Prewitt edge detector, second order derivative is used for edge detection.

True/False

**False: First order derivative is used for edge detection**

**Questions 3:**

In Sobel edge detector, we use first order derivative to detect edges and therefore we need a threshold to determine whether we have an edge or not. To overcome this limitation, Marr-Hildreth edge detector use second order derivative for detecting edges where zero-crossings represent edges and therefore we do not need any threshold.

True/False

**False: Threshold is still needed determine valid zero crossing based on the slopes.**

**Question 4:** Smoothing filter is used during edge detection to avoid any false edges caused by noise.

**True/False**

**True: Smoothing filter is used for avoiding any false edges**

**Question 5:** In Sobel edge detection, we can optimize the number of computation steps by combining smoothing and derivative filters.

True/False

**True: Optimization can be done by combining both steps**