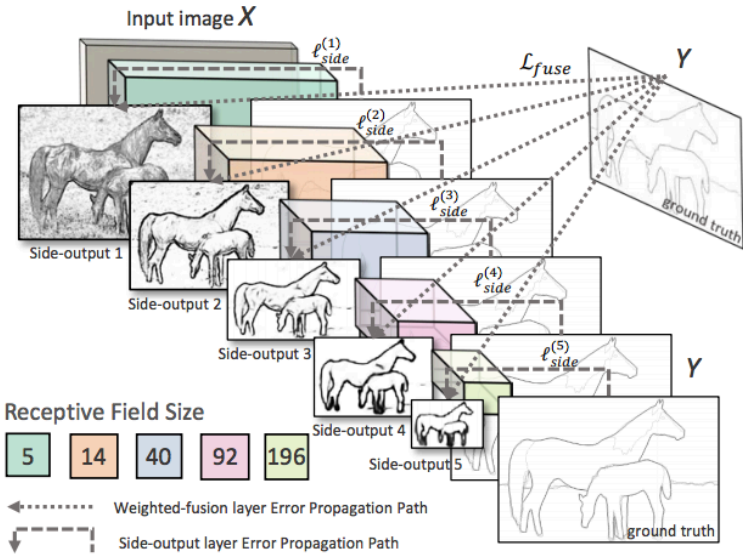


**Title:** Sketching Using Holistically-Nested Edge Detection

**Faculty Sponsor:** James Tompkin

**Abstract:** The goal of this project was to generate sketched versions or edge maps of an image, given an original black and white or color image. In order to do this, we implemented Holistically-Nested Edge Detection (HED) [1]. This is a convolutional neural network model that performs image-to-image training to directly generate edge maps given an original image. The model aims to be an improvement over other edge detection methods like Canny Edge Detection due to its ability to learn hierarchical features of an image. It is also much more computationally efficient than other CNN-based solutions. Our trained model was able to generate sketches/edge maps with a high level of detail and preserve many higher level features of the images that Canny Edge Detection was not able to preserve. This helped us create more recognizable sketches.

**Diagram:** Shows at a high level what the network architecture of the model looks like.



**References:**

[1] Zhuowen Tu and Saining Xie. Holistically-nested edge detection. 2015