Edge Detection (Sobel Filter)

The Sobel filter module is designed to contain multiple computational units that can be scaled to allow concurrent processing images of various sizes, where the number of computational units are flexible. The modularization design of the system also allows reusing of calculations by sharing and exchanging the weighted sums between different sub-modules to achieve high-performance and efficient processing of edge detection.

A black background with white circles and red lines

Description automatically generated

Fig 4. Illustration on flexibility of filter

|  |  |
| --- | --- |
| Fig 5. Sobel filter computational unit | **Progress** |

**Conclusion**

We hope that this project would provide a high-performance, efficient and scalable way to accelerate image processing through hardware acceleration, which would help the ever-changing industry of high-performance computing and machine learning fields.