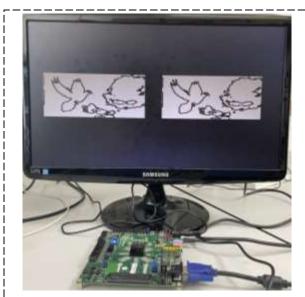# Low Computation and High Efficiency Sobel Edge Detector for Robot Vision

Fei Liu, Jipeng Wang, Bingqiang Liu, Run Min, Guoyi Yu, Fengwei An and Chao Wang

School of Optical and Electronics Information, Huazhong University of Science and Technology, China

- An area-efficient and energy-efficient Sobel edge detector design is proposed.

- The bit-width pruning, shift-add operation and bit-width tuning techniques is utilized.

- The required area and computation is significantly reduced with negligible edge information loss.

- The detector is suitable for resource-limited and energy-constrained mobile robots in edge IoT applications.

FPGA demonstration of proposed Sobel edge detector