Channel noise canceller for Image in fpga

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Project Outline

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- FPGA-based channel noise canceller using a fixed-point standard-LMS algorithm for image.
- Loading image from arduino to fpga
- Implementing the the 2D LMS algorithm in fpga
- Calculating error and updating the filter

Implementation

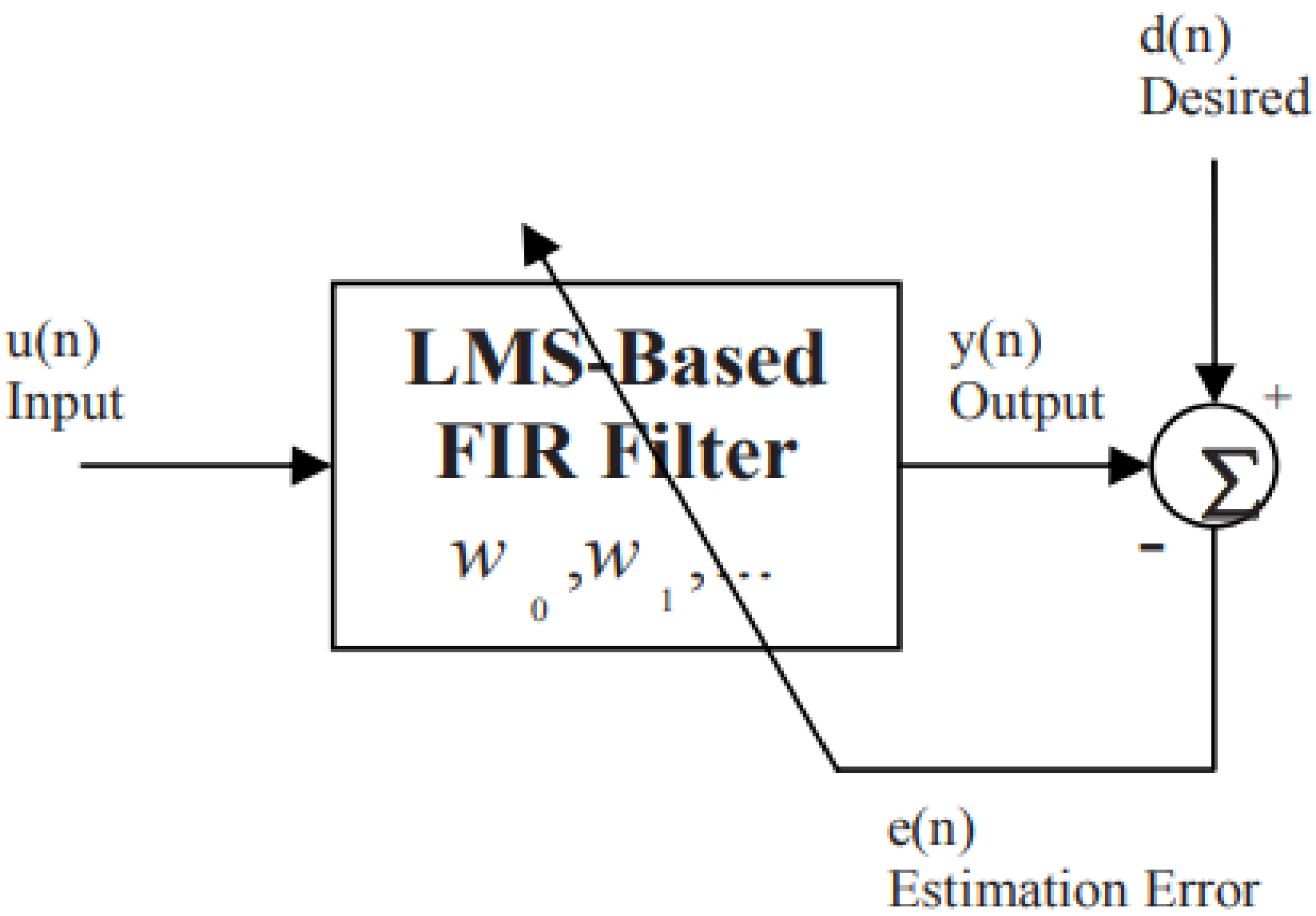
Input and Output

- Load pixel values to arduino through serial communication using python script.
- Convert pixel values to binary in arduino and send these bits through gpio pins to fpga.
- Read the output bits through another arduino(digital read) and display image using python script.

Applying filter to image

- Let u(i, j) be the input of a linear 2D FIR model,defined over a regularly spaced lattice [n ,m], where n and m specify the order of the input data. The output of the 2D finite impulse response (FIR) digital filter. y(i,j)=sum$_{t=0}^{n-1} \sum_{l=0}^{m-1} w[t, l] * u[i - t, j - l]$.

CALCULATING ERROR AND UPDATING WEIGHT VECTOR



Thank You