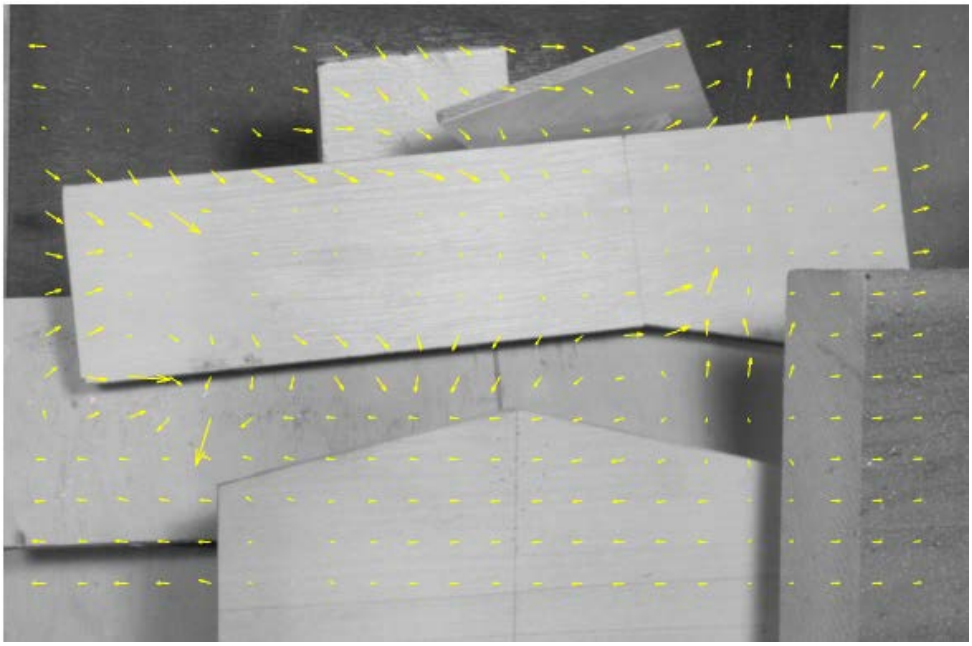
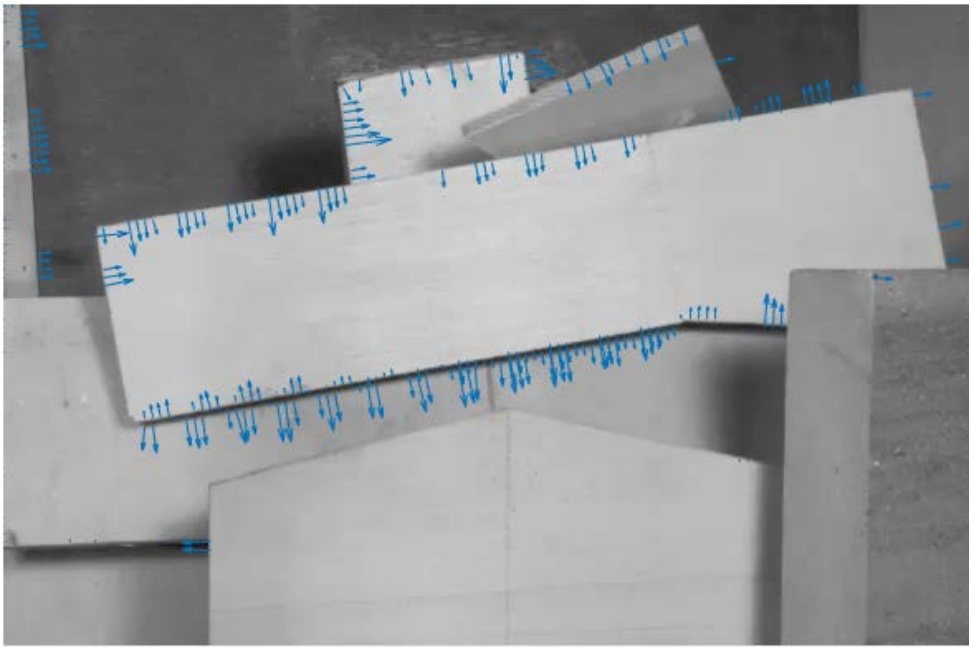
Optical Flow

Jiawei Ge

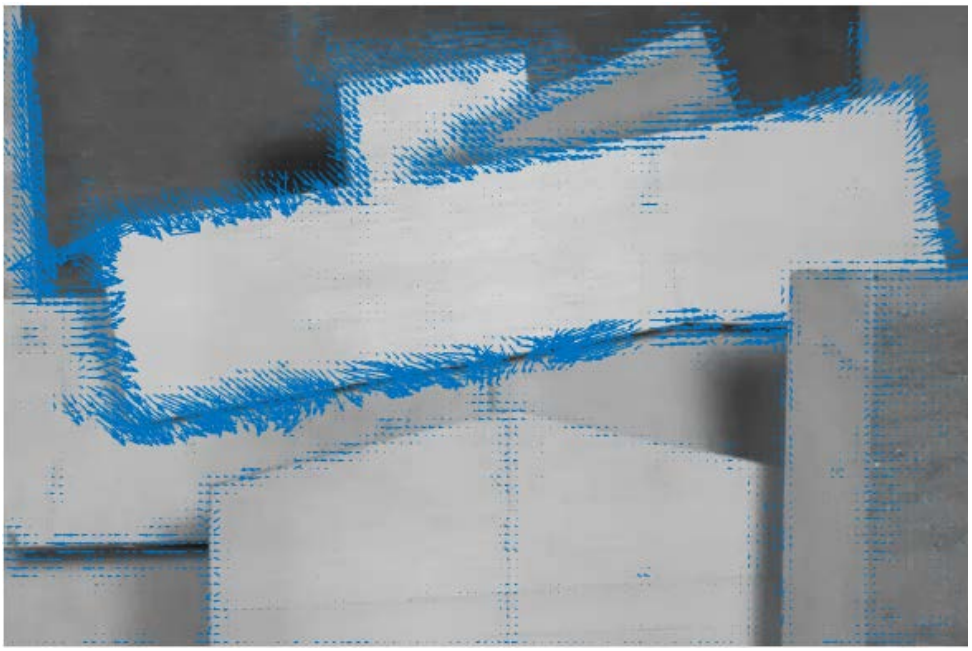
1. Wooden sample results using 4 different algorithm by comparing the 4th frame to the 5th frame.
    a. My own implementation:



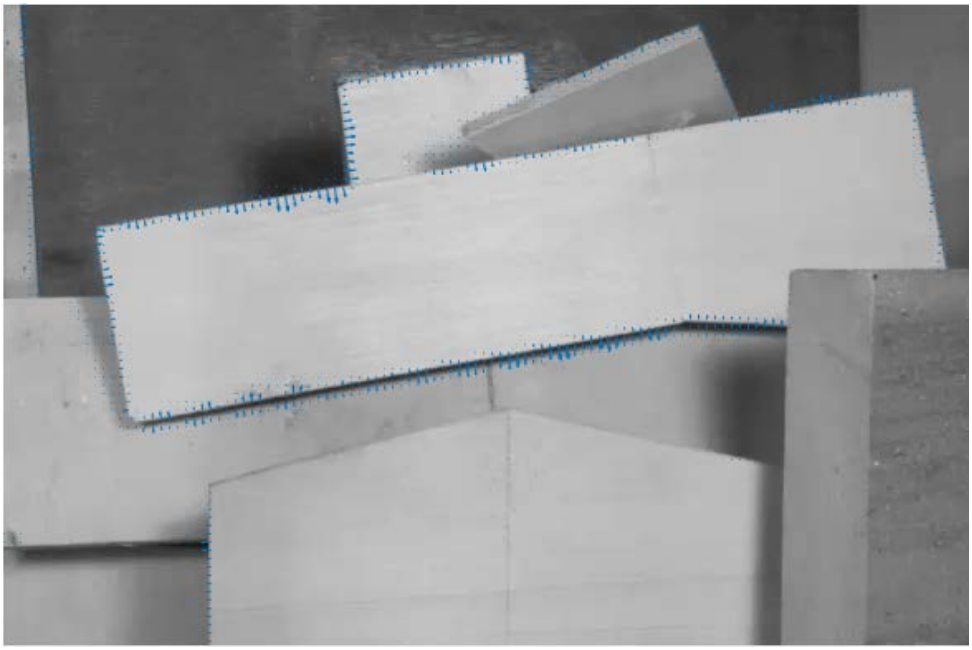
    b. Lucas-Kanade algorithm:



c. Farneback algorithm:

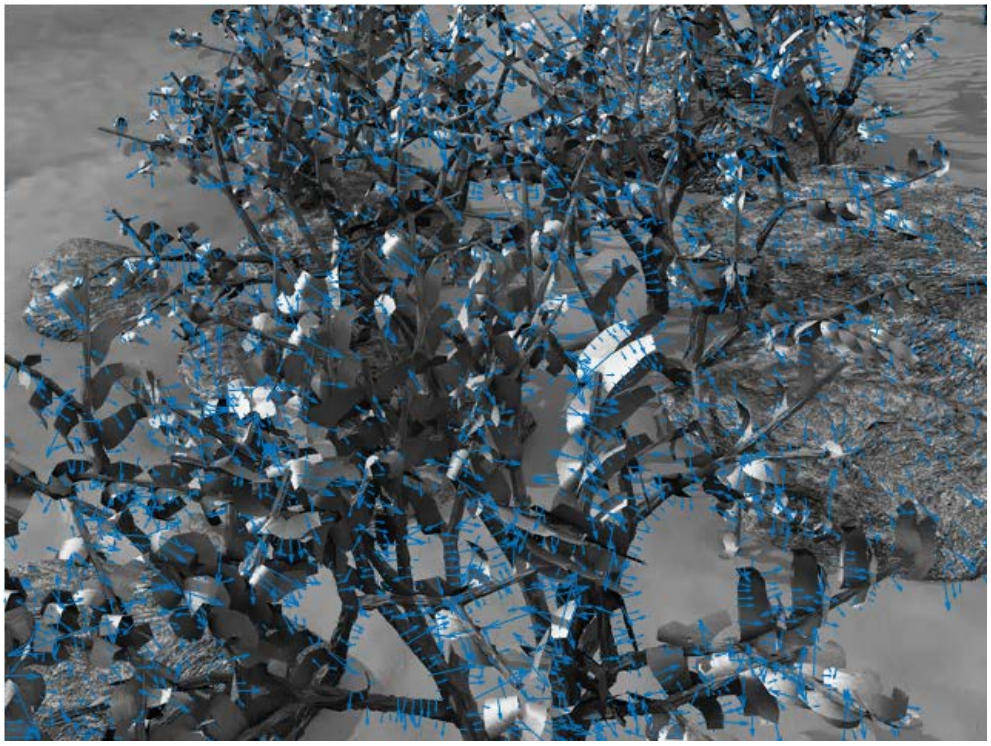


d. Horn-Schunck algorithm:



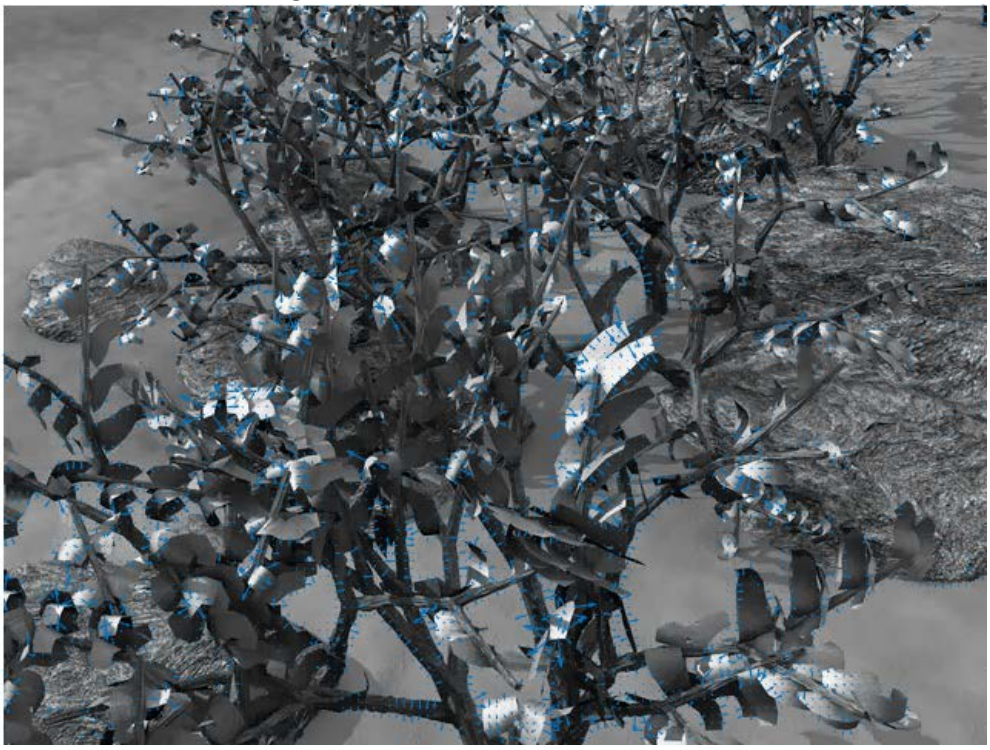
2. Grove sample results using 4 different algorithm by comparing the 4th frame to the 5th frame.
    a. My own implementation:

    b. Lucas-Kanade algorithm:



c. Farneback algorithm:

d. Horn-Schunck algorithm:



3. Results cpmparison.
    a. In the first place, it's apparent the Farneback algorithm preserves most pixel motions and show them in the final plot. It has the best performance for object boundaries because it is the only algorithm shows the wooden plate isn't performing a single rotation movement – it moves to the right as well when rotates. The results from Farneback combine the 2 velocity portions rather than have a movement direction almost perpendicular to the edges, like what LK and HS show us.
    b. Secondly, the Farneback works better for non-textured regions. As we can see from the wooden samples, it is the only algorithm show the opric flow in the non-textured regions, even it's too small to be observed.
    c. LK and HS algorithm performs better in textured regions. If you take a look at the result from grove sample using Farneback, you can barely tell the optical flows because there are too many of them to be mixed. Compared to LK and HS, the amount of the preserved flows is appropriate. People can tell the textured regions' moving direction easily and correctly.