Advanced Computer Vision Homework3

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Objective:

Synthetically translate lena.im one pixel to the right and downward.

Implement Horn & Schunck optical flow estimation with λ of 0.1, 1, 10.

parameters:

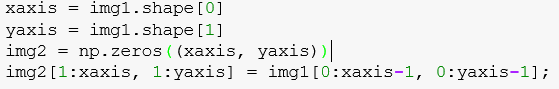
1. λ = 0.1, 1, 10
2. iteration = 8, 80, 800, 1800

Method:

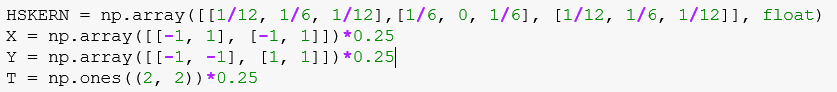
1. Read BMP file



1. Move lena.bmp one pixel right and down



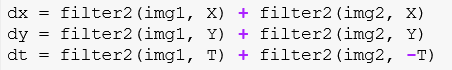
1. Set kernels of Horn & Schunck algorithm



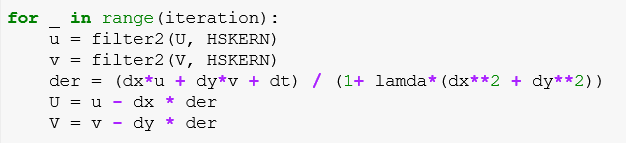
1. Initialization of velocities



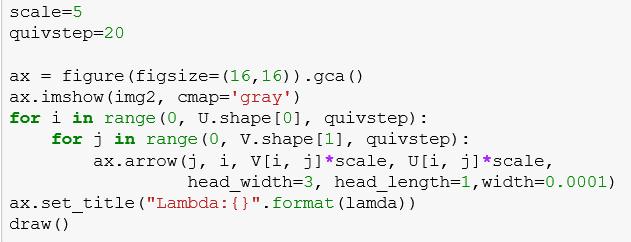
1. Calculate the of derivatives



1. Estimation optical flow



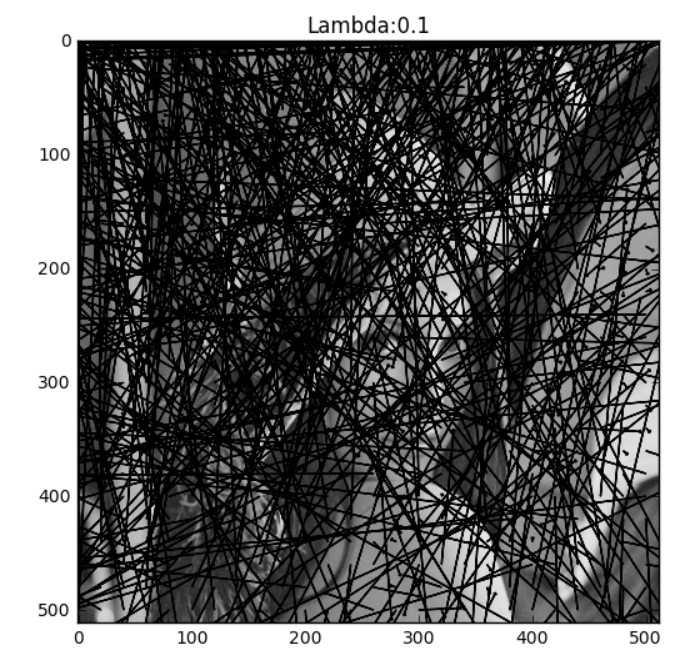
1. Plot



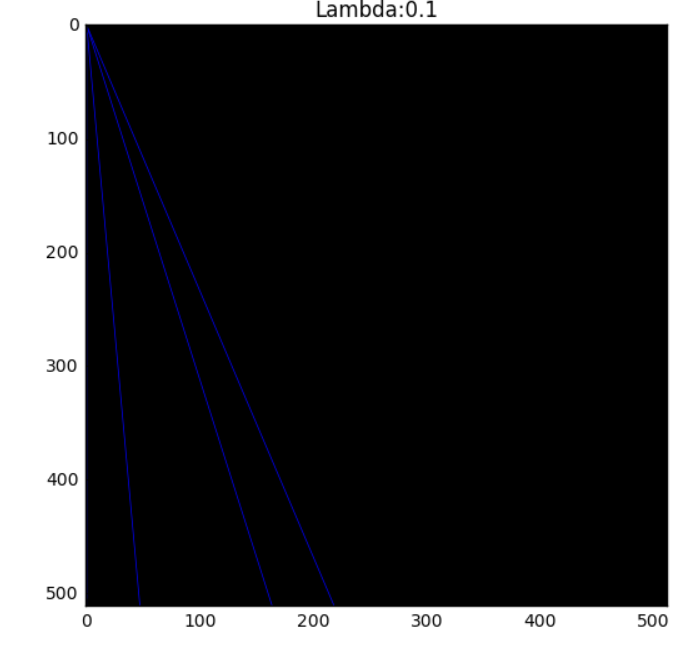
Result:

Results show that iteration of 8 seems enough for λ = 0.1 and λ = 1 but not λ = 10. For λ = 10, iteration of 80 shows better outcome. For λ = 0.1, iteration over 80 is too large and may even lead to multiply overflow.

1. λ = 0.1, iteration = 8



1. λ = 0.1, iteration = 80



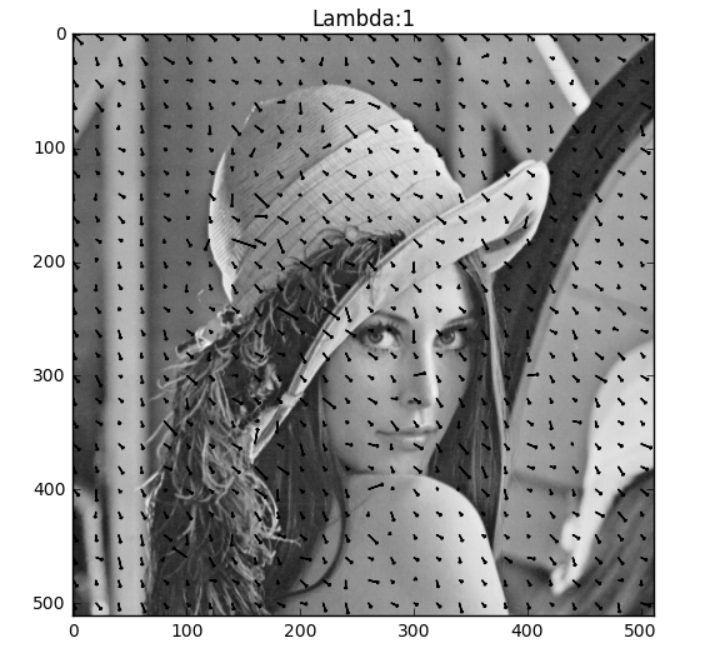
1. λ = 0.1, iteration = 800

multiply overflow

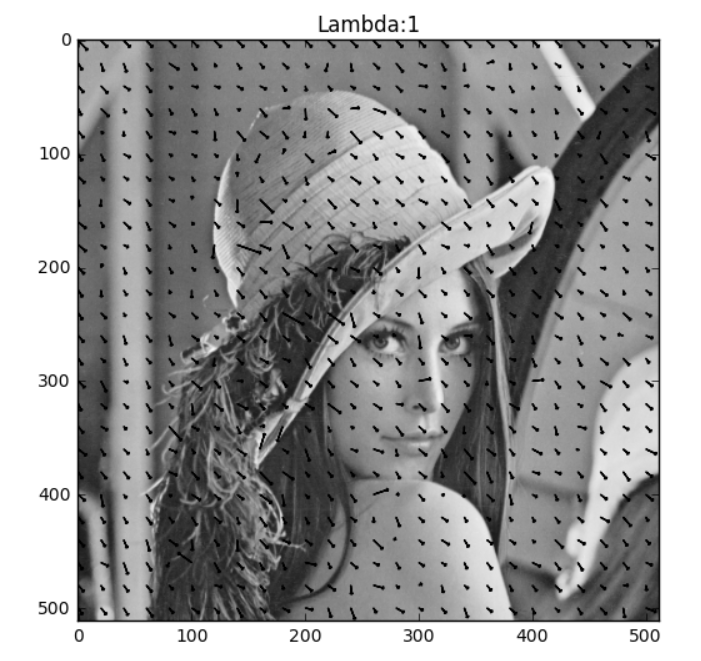
1. λ = 0.1, iteration = 1800

multiply overflow

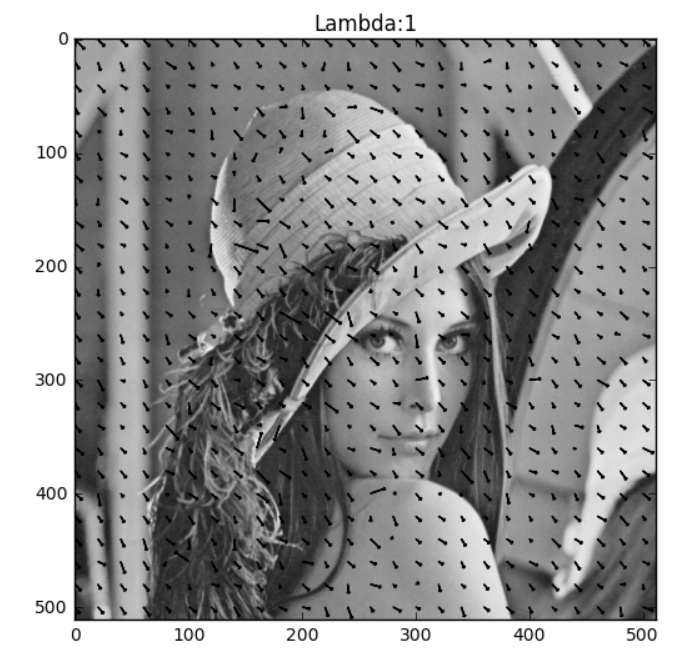
1. λ = 1, iteration = 8



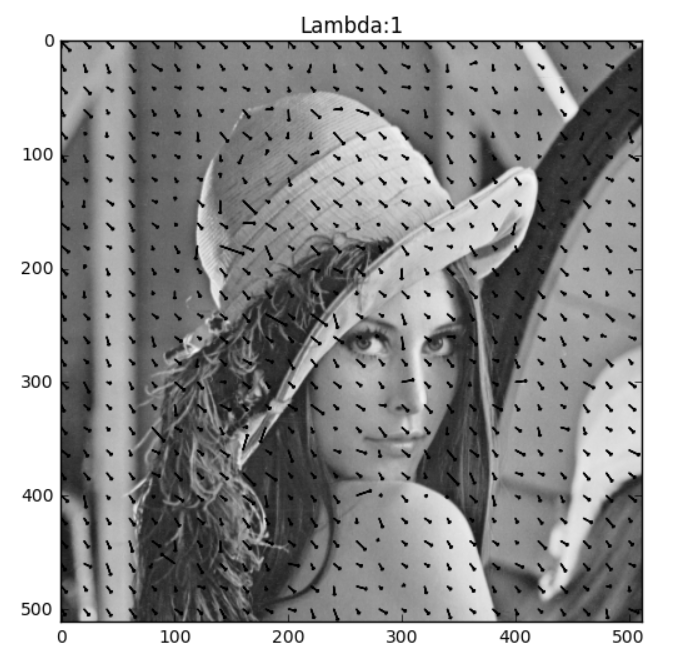
1. λ = 1, iteration = 80



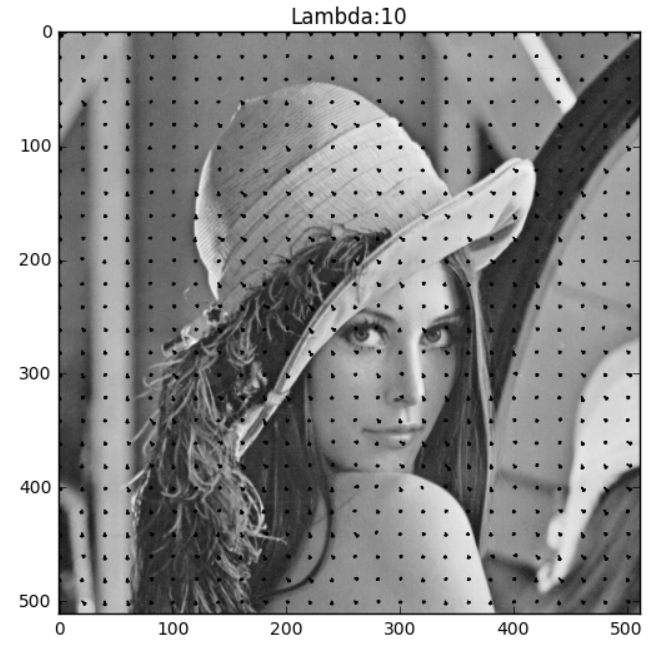
1. λ = 1, iteration = 800



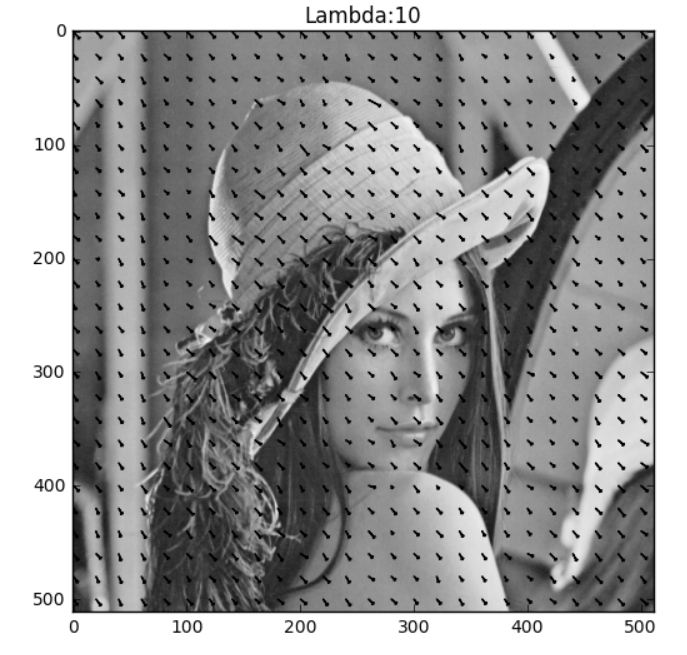
1. λ = 1, iteration = 1800



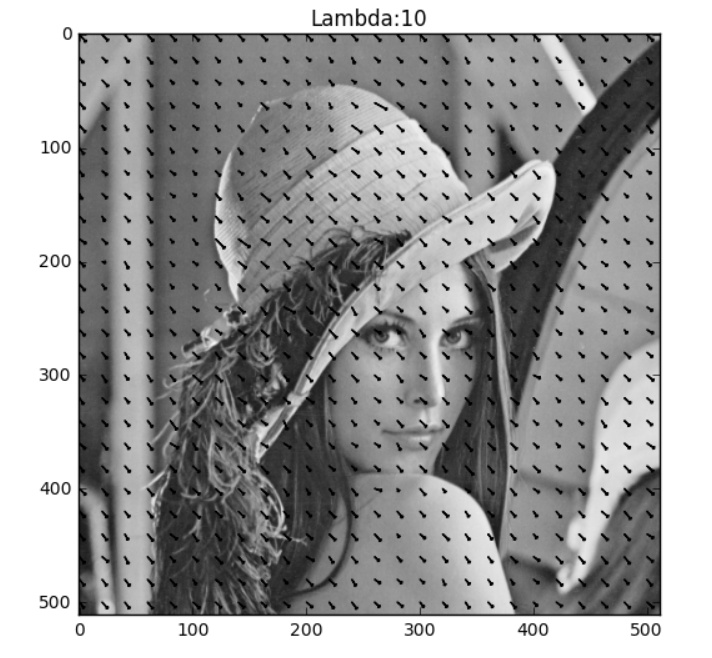
1. λ = 10, iteration = 8



1. λ = 10, iteration = 80



1. λ = 10, iteration = 800



1. λ = 10, iteration = 1800

