

```

89 % Section 4: Create structure matrix
0.02 2 90 nablaI(:, :, 1) = I_x.*I_x;
2 91 nablaI(:, :, 2) = I_x.*I_y;
2 92 nablaI(:, :, 3) = I_y.*I_y;
93
94 % Section 5: LP filter structure matrix
0.16 2 95 Ky = Kx';
2 96 J = imfilter(imfilter(nablaI, Kx, 'conv', 'replicate'),
97 Ky, 'conv', 'replicate');
98
99 % Section 6-8: Eigenanalysis, modulation and constant
0.16 2 100 [a, b, c, d] = fastI(J, alpha, beta, s2, inImage, I);
101
102 % Section 9: Solve diffusion equation
0.03 2 103 if (useAOS == 0)
2 104 I = I + divergence(a.*I_x + b.*I_y, c.*I_x +
105 else
106 InextN = solveAOSN(I, N, M, a, b, c, d, tau,
107 InextM = solveAOSM(I, N, M, a, b, c, d, tau,
108 I = InextM + InextN;
109 end
110
111 % Optional plotting
2 112 if (graphs == 1)
113 figure;
114 subplot(3,1,1); imshow(I, []); title(['Iteration
115 title(['I of iteration ' num2str(k)]);
116 subplot(3,1,2); imshow(I_x, []);
117 title(['Derivate dI/dx of iteration ' num2str(k)]);
118 subplot(3,1,3); imshow(I_y, []);
119 title(['Derivate dI/dy of iteration ' num2str(k)]);
120 figure('Name', ['LP-filtered Tensor J of iteration ' num2str(k)]);
121 subplot(3,1,1); imshow(J(:, :, 1), []);
122 title('dI/dx*dI/dx');
123 subplot(3,1,2); imshow(J(:, :, 2), []);
124 title('dI/dx*dI/dy');
125 subplot(3,1,3); imshow(J(:, :, 3), []);
126 title('dI/dy*dI/dy');
127 end
2 128 end
129
130 % Optional Plotting
1 131 if (graphs == 1)
132 figure; plot(inImage(floor(N/2), :), 'r'); hold on; plot(I, 'b');
133 legend('Original with Speckle', 'Processed');
134 end
135
136 % Section 10: Return time and processed image
< 0.01 1 137 timeSpent = toc;
1 138 I = uint8(I);

```