

Exercise Sheet Computer Vision 6

Submission: 16.06 12:00

(3 Points)

Exercise 1 Jacobian (10 Points)

- a) Given the minimization objectives (a) transfer distance in one image and (2) symmetric transfer distance, compute the Jacobians. (10 Points)

Exercise 2 Levenberg-Marquardt (10 Points)

- a) You are provided with four generic measurements of a process (t_i, y_i) with $i = 1, 2, 3,$ and 4 . Given t_i , the y_i values can be approximated with the equation $m(x_i, t_i) = e^{t_i x_1} + e^{t_i x_2}$. Your goal is, with this information, to approximate x_1 and x_2 parameters with the Levenberg-Marquardt algorithm. Describe in detail the pseudo code you would use indicating the equation and dimensions of the matrices/vectors J , J^T , g , H and d for the given example. You don't need to compute inverse matrices. If you want to indicate that the matrix should be inverted you can indicate it as follows: A matrix you computed, A^{-1} inverse of A . (Hint: Write at least a sentence for each step of the algorithm giving the requested additional information and explain input and output parameters e , x_0 , and ϵ as well)