Technion – Israel Institute of Technology



HW4

Vision Aided Navigation

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## Pose SLAM

### Question 1: Assume you are given a prior on initial pose Additionally, suppose the robot obtains noisy odometry (relative pose) measurements , with Express the joint posterior as a product of the form and the prior probabilistic terms. We shall call the probabilistic terms comprising the joint posterior factors.

### Question 2: Formulate the smoothing optimization problem. Describe an iterative process to obtain the MAP estimate.

Above is the formulation of the optimization problem.   
We provide an optimal solution via LMS, pseudo-inverse below:

We define:

Linearizing around *:*

We Define

The vector which minimizes the squared residuals is given by minimizing with pseudo-inverse:

As such, the solution for our states will be given by:

The combined covariance on all states: