

ARO Homework 3: 2D beacon SLAM.

Karel Zimmermann, Libor Wagner

Robot has followed trajectory consisting of M unknown positions $\mathbf{x}_j \in \mathbb{R}^2, j = 1 \dots M$. From each j -th position, N distances $\mathbf{d}_i^j \in \mathbb{R}$ towards N different beacons at unknown locations $\mathbf{a}_i \in \mathbb{R}^2, i = 1 \dots N$ was measured. Given the set of $M \times N$ measured distances $\mathbf{d}_i^j \in \mathbb{R}$, reconstruct the trajectory and beacon positions.

1. Download `HW03.D.zip` data file, which contains $M \times N$ array with measured distances.
2. Formulate the problem as a overdetermined set of non-linear equations.
3. Linearize the problem and impose additional constrains. Iteratively solve the problem.
4. Draw reconstructed trajectory and beacons into a common figure.