

ELEC-E8111 Autonomous mobile robots.

Exam 10.4.2018

1. What kind of laser range finders (LIDAR, laser scanner) there are in the market? In the mobile robotics, describe shortly how the measured 3Dpointclouds are typically processes and analyzed? 6 p
2. Describe the kinematic planar model of a typical differential drive type indoor robot platform, How odometry can be implemented with it? 6p
3. Explain shortly the structure of Inertial Measurement Unit (IMU). Explain shortly the essential principles of calculating the pose on the basis of the IMU measurements. 6p
4. Explain the essentials similarities and differences between the extended Kalman filter (EKF) and the particle filter, exact equations are not required. 6p
5. Explain shortly the main approaches for modelling of the environment of a mobile robot. How the models are updated. 6p
6. D* is widely used path planning algorithm in mobile robots. Describe shortly the main ideas and features? 6p