

Musashi Seimitsu Industry Co., Ltd. Develops Prototype of Industrial Autonomous Carrier Robot in Six Months

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Musashi Seimitsu Industry Co. Ltd. developed a prototype system of an industrial autonomous carrier robot in six months. Developing an independent four-wheel steering system, especially tuning the motion controller iteratively, is very challenging. To minimize iterative development, Musashi Seimitsu Industry adopted Model-Based Design.

Musashi Seimitsu engineers used Simulink® to model the complex vehicle dynamics and used simulation to optimize the motion controller parameters.

In addition to sensors, the autonomous driving vehicle will need to have maps of the environments and the ability to estimate an egocentric pose of the vehicle within the map. Using Robotics System Toolbox™, the engineers built two-dimensional maps offline and tested the localization algorithm with the maps in simulation.

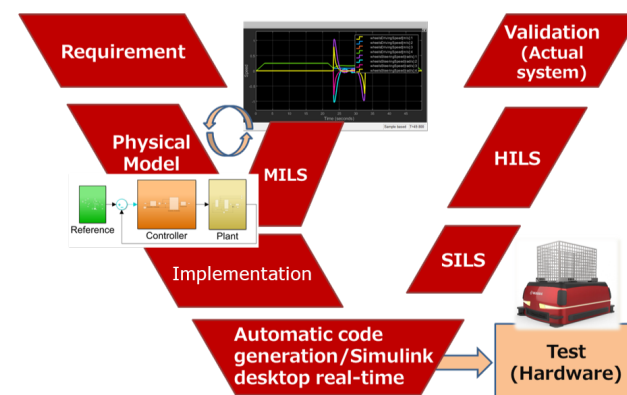
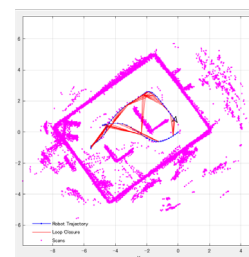
The next challenge is localization with lidar and other sensors. Musashi Seimitsu engineers will work on sensor fusion to integrate the IMU and odometry.

Advantages of using MATLAB:

- Shortened development time for tuning controller algorithms by performing simulation
- Tested lidar-based localization algorithm in desktop simulation



Using MATLAB and Simulink, we designed a prototype for the motion controller and tested it on the hardware within a month. The localization algorithm was evaluated and challenges were clarified by performing simulations.



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