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Unexpected obstacles generated time delay management

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Unexpected obstacles generated time delay management

Collaborators

- Laboratoire d'Informatique et des Systèmes LIS
- ST Microelectronics, Rousset

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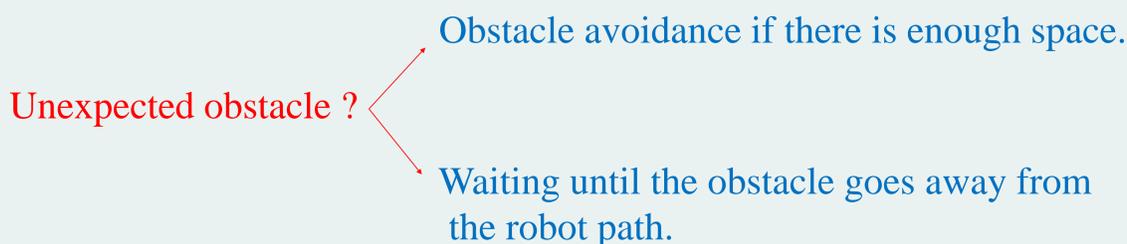
OBJECTIVES

- Trajectory reconfiguration for the unexpected obstacles generated time delay reduction or compensation.
- Optimal production by achieving the robot transportation missions by respecting as well as possible their planned duration.

PRODUCT TRANSPORTATION IN THE FAB

- Integrate omnidirectional wheeled mobile robots in the fab to transport products between equipment units.
- The main objective is to optimize the production.

Problematic: Encountering unexpected obstacles on the robot path is inevitable in a dynamic environment such a fab.



- In both cases, meeting an unexpected obstacle while operating generates a time delay with regard to the mission planned duration.
- Time delay can impact significantly the production yield.

Solution ? Trajectory reconfiguration with respect to the environment changing in order to compensate/reduce the generated time delay.



Figure 1: Kuka robot.

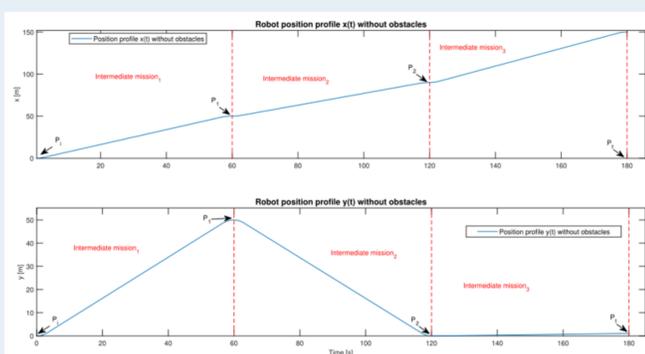


Figure 2: $x(t)$ and $y(t)$ reference trajectories to track in the absence of obstacles.

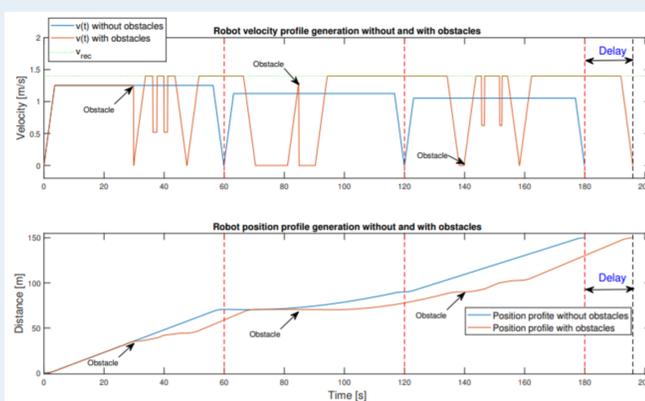


Figure 3: generated velocity and position reference trajectories in the absence and in the presence of obstacles.

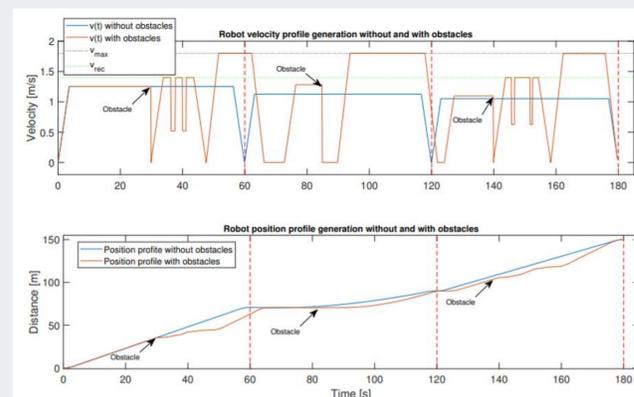


Figure 4: velocity and position reference trajectories reconfiguration for the time delay compensation.

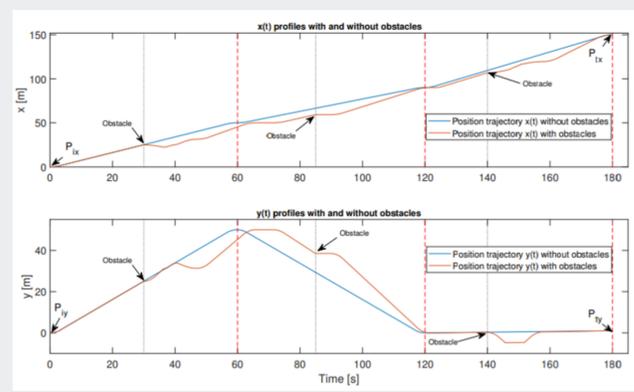


Figure 5: $x(t)$ and $y(t)$ reference trajectories updating.