



Unexpected obstacles generated time delay management

Samia Mellah, Guillaume Graton, El Mostafa El Adel, Mustapha Ouladsine,
Alain Planchais

► To cite this version:

Samia Mellah, Guillaume Graton, El Mostafa El Adel, Mustapha Ouladsine, Alain Planchais. Unexpected obstacles generated time delay management. Dernier Consortium du projet européen Productive4.0, Oct 2020, Online, France. hal-03420086

HAL Id: hal-03420086

<https://amu.hal.science/hal-03420086>

Submitted on 8 Nov 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Unexpected obstacles generated time delay management

Collaborators

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

Samia MELLAH, Guillaume GRATON, El Mostafa EL-ADEL, Mustapha OULADSINE, Alain PLANCHAIS

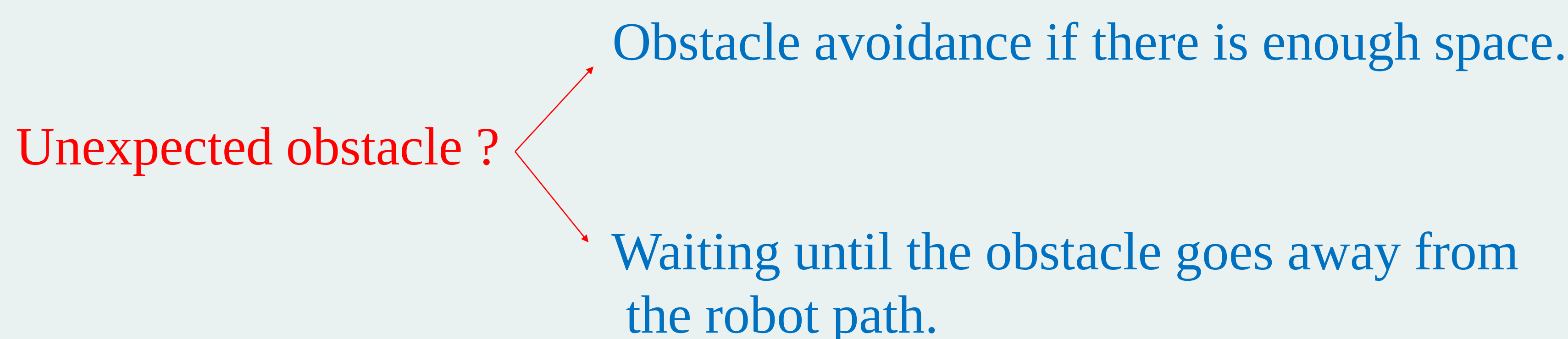
OBJECTIVES

- 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 environnement changing in order to compensate/reduce the generated time delay.

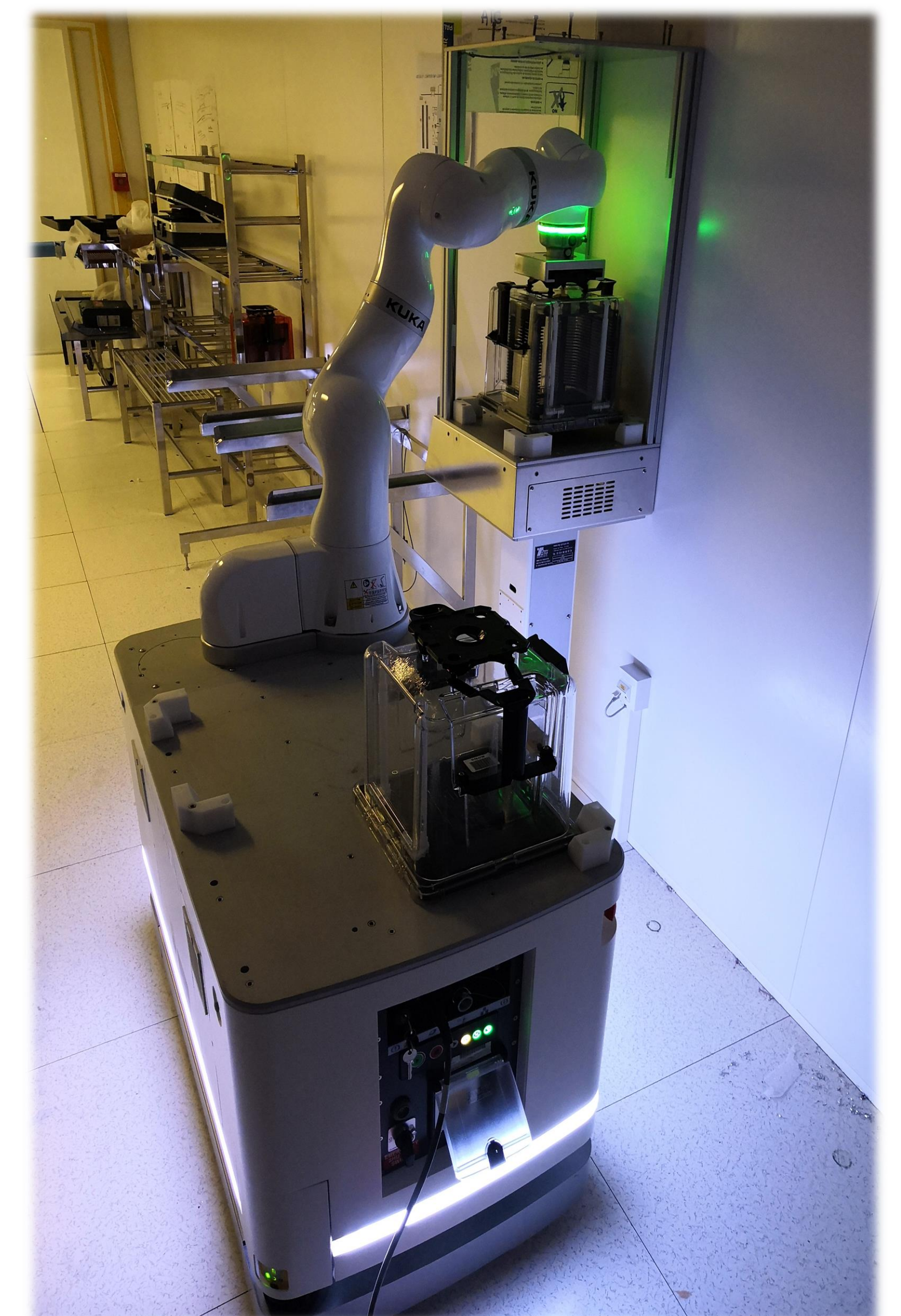


Figure 1: Kuka robot.

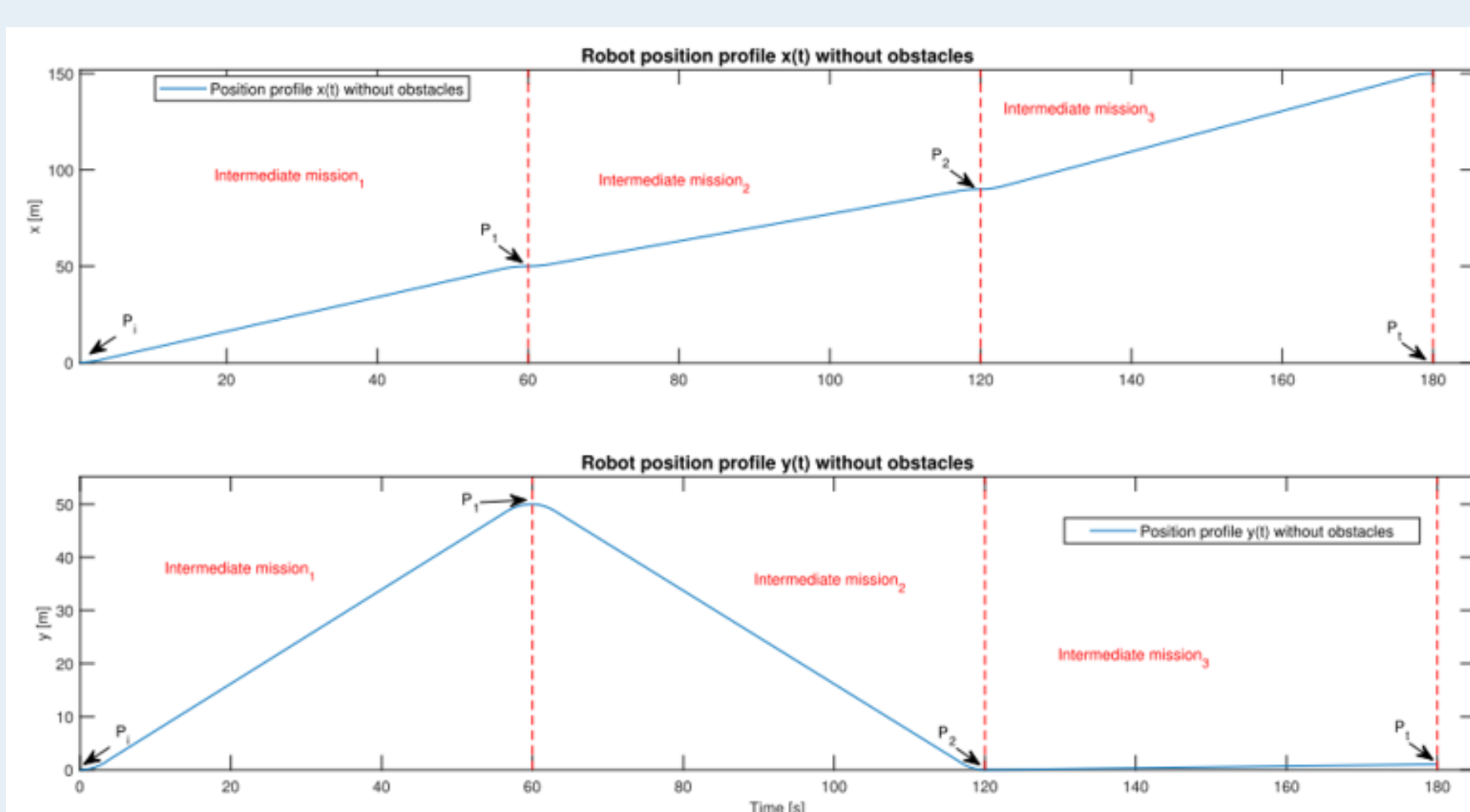


Figure 2: $x(t)$ and $y(t)$ reference trajectories to track in the absence of obstacles.

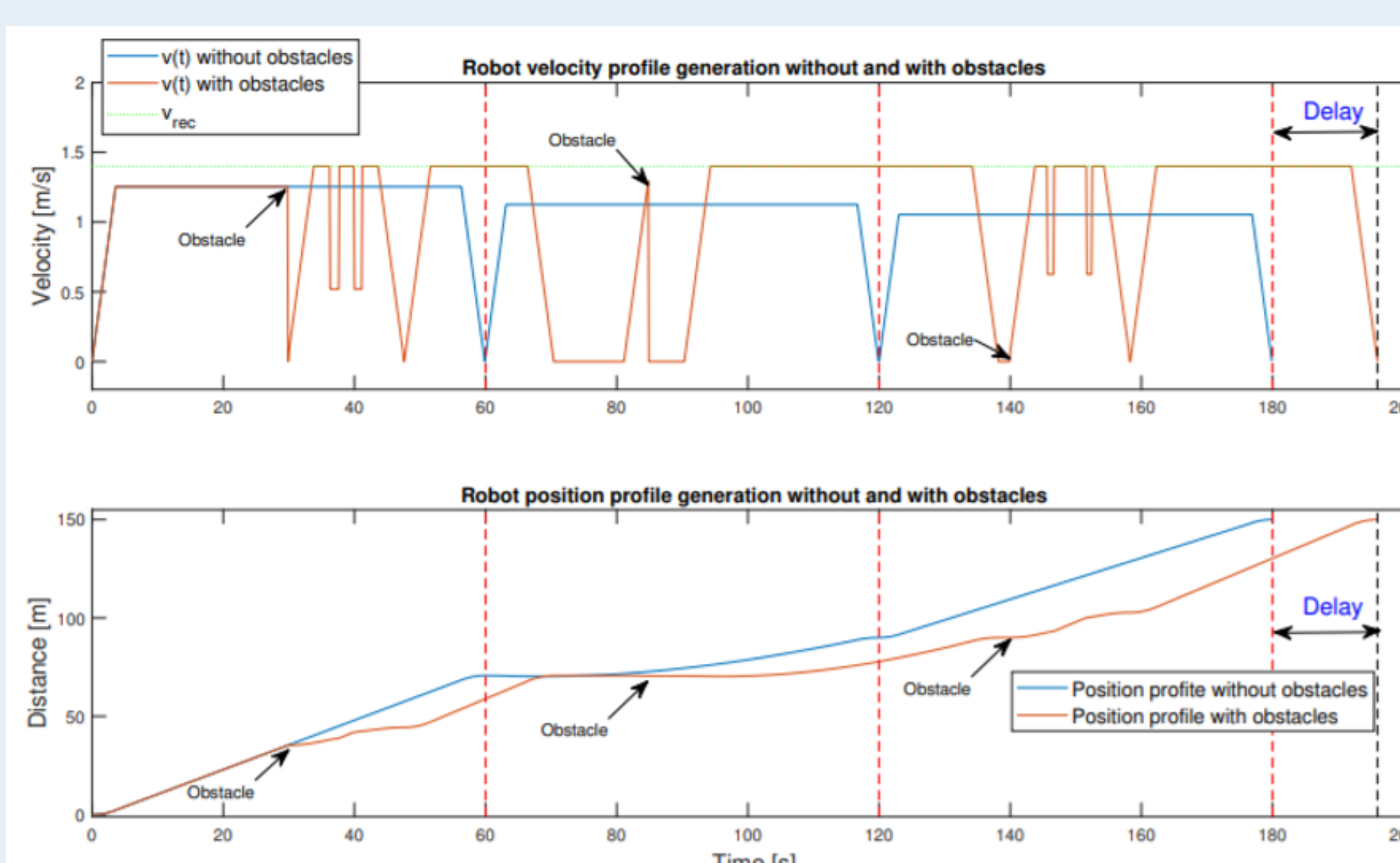


Figure 3: generated velocity and position reference trajectories in the absence and in the presence of obstacles.

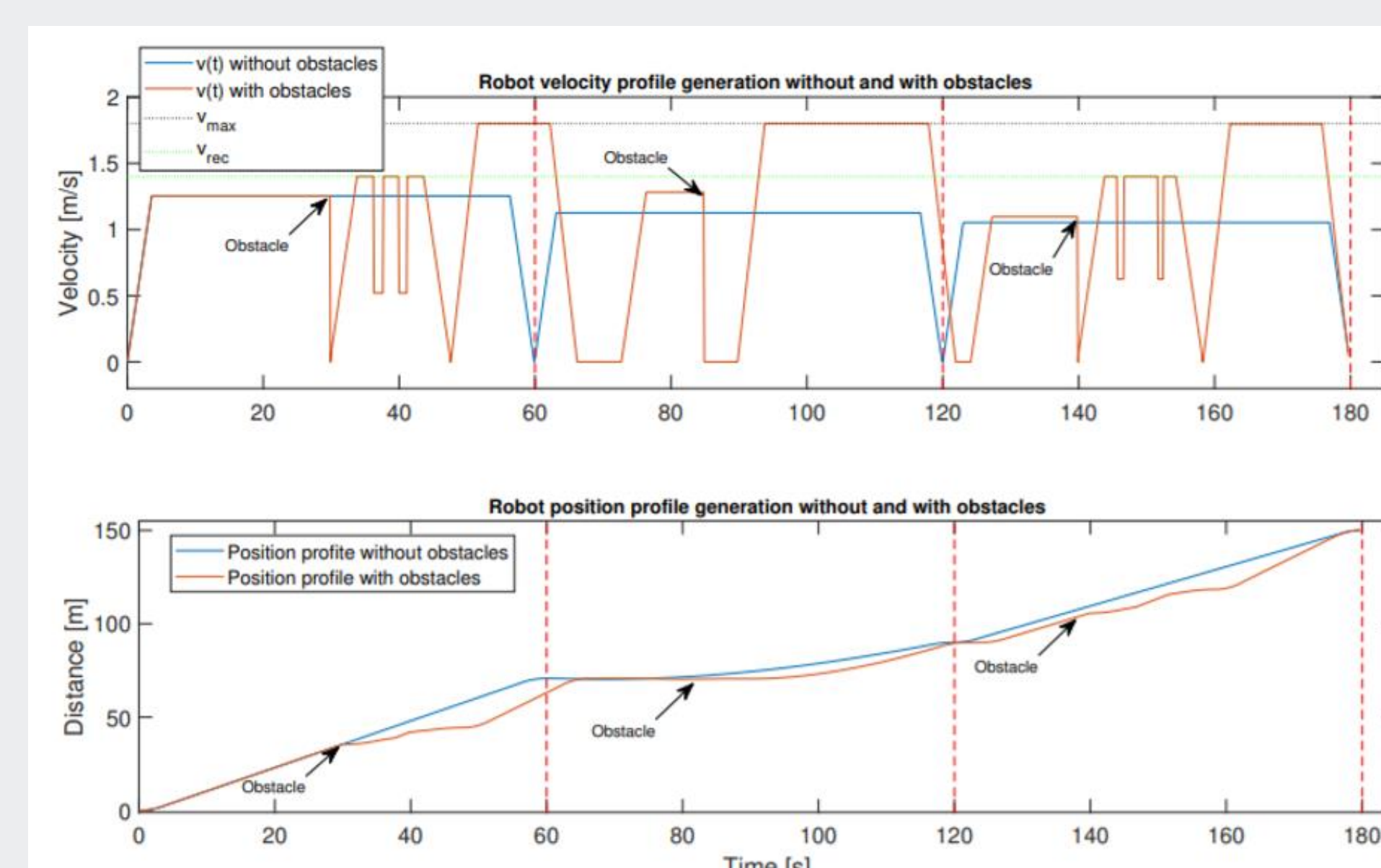


Figure 4: velocity and position reference trajectories reconfiguration for the time delay compensation.

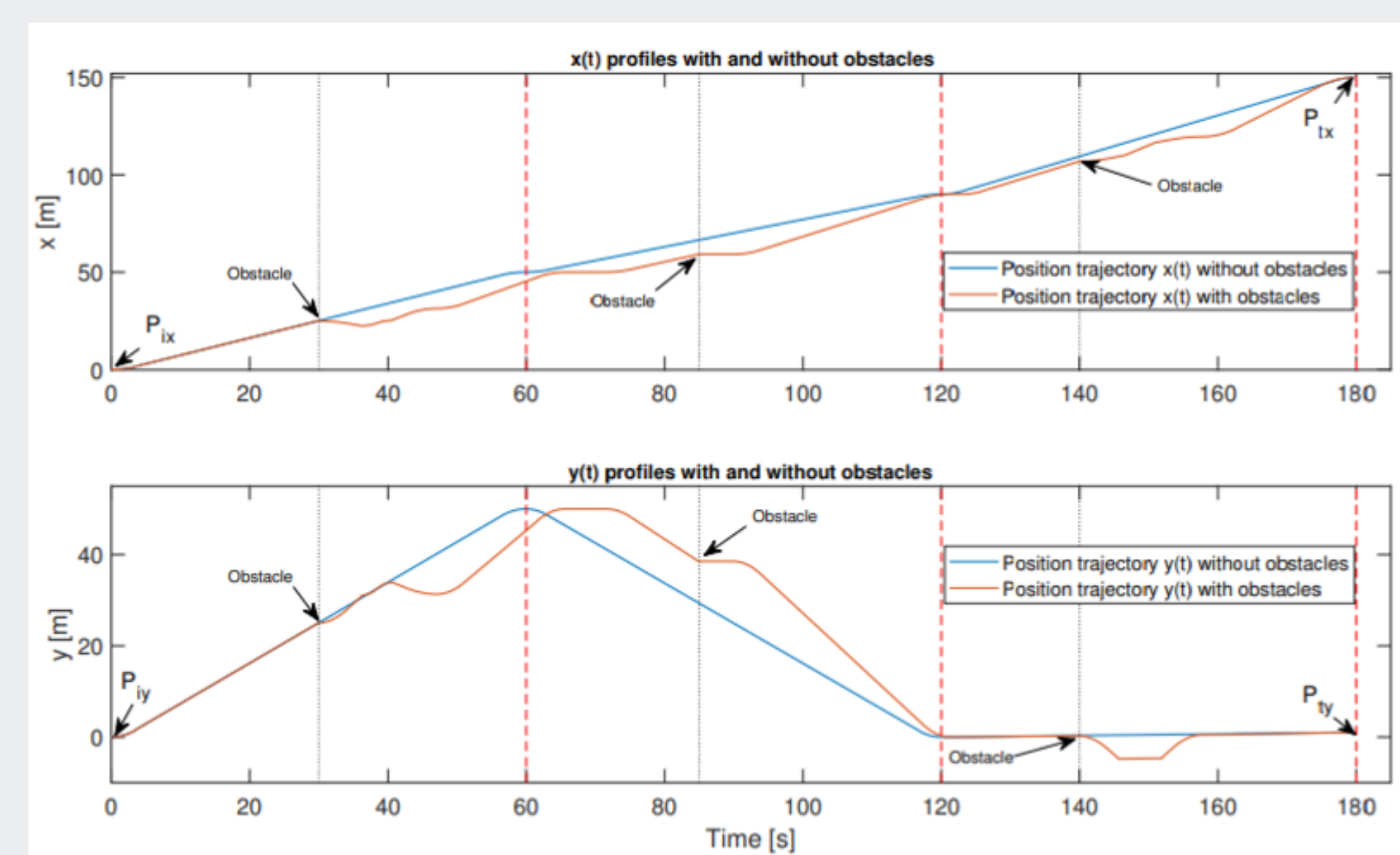


Figure 5: $x(t)$ and $y(t)$ reference trajectories updating.