

TRACEABLE ROBOTIC HANDLING OF STERILE MEDICAL PRODUCTS

INTRODUCTION

- Creating new healthcare products requires testing huge numbers of samples. Today manual procedures dominate, since regulations require understanding of the execution of each process step and systematic checking to verify task completion.
- TraceBot has adopted sterility testing as use case, a key process in the distribution of medical products. Automation is needed to reduce cost, to improve the quality of production and working conditions. The capability to verify and trace robot actions would overcome a barrier in medical industries.

OBJECTIVE

- bring verifiable actions to robot manipulation by reasoning over sensor-actor trails in a traceability framework based on digital-twin technology.
- extend current robot motion planners by the automatic execution of self-checking procedures and creating a semantic trace of the actions performed for reasoning about the correct execution of the production steps.
- create robotic systems able to understand what they perceive and do, to ensure that any manipulation action is verified, so leading to the Audit Trail required in the regulated environment.

APPROACH

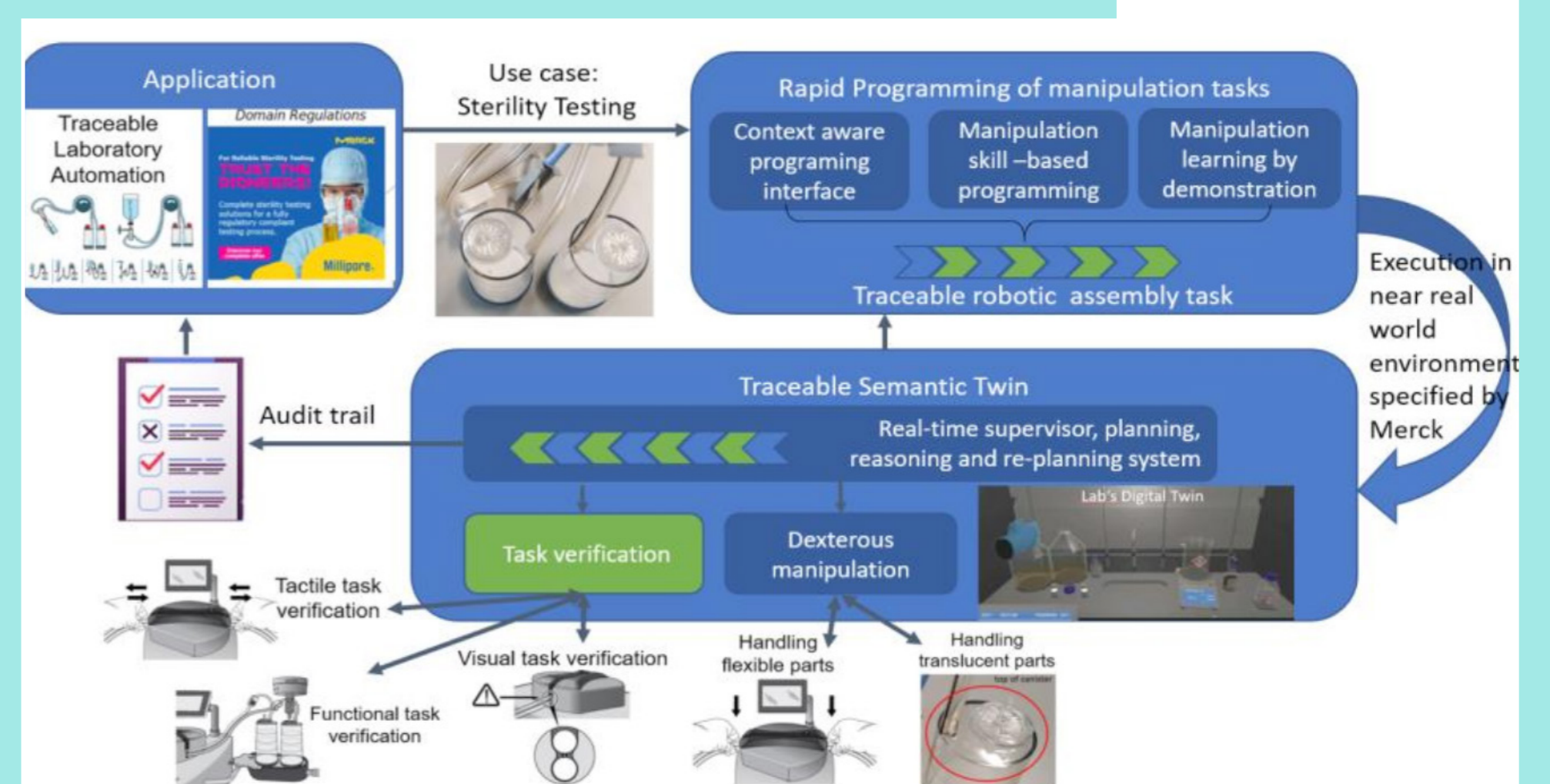
1. Focusing on a real and challenging use-case: sterility testing.
2. Monitoring market needs, by sharing results with pharmaceutical stakeholders + Advisory Board.
3. Progressing in several technological domains:
 - Perception means and tactile fingers/grippers for detecting and handling medical products.
 - Manipulation skill framework providing inherent checking actions for every assembly step.
 - Advanced symbolic cognition scheme for ensuring safe and failure-resistant operation.
 - Intuitive programming interface for a quick adaptation to novel products and tasks.

USE CASE

The sterility testing task has been selected as the exemplar task. Each task step consists of perception (identification, localisation), manipulation (grasping, lift/pull/move, placing) and checking operations (force, visual, actions). The checking elements have been specially designed into the process to catch all possible failure modes and correct execution is a regulatory requirement. This avoids invalid test results and distinguishes this use case from those not requiring traceability.



TRACEABLE SEMANTIC TWIN



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