



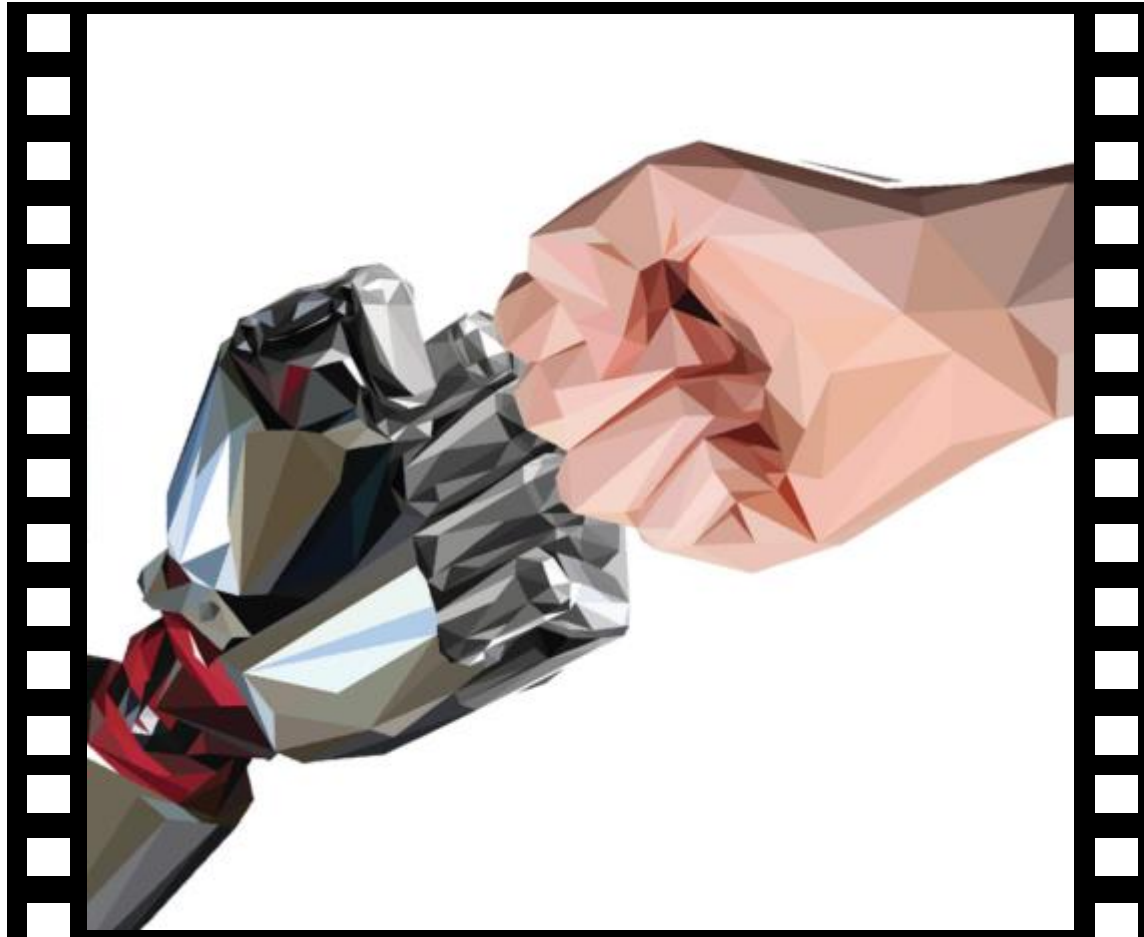
Industrial Robotics for the factory of the future

David Bitonneau & Théo Moulières-Seban

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COBOTICS ≠ ROBOTICS



WHY COBOTICS ?



Performance



Working conditions



Safety



Keep experts in their jobs

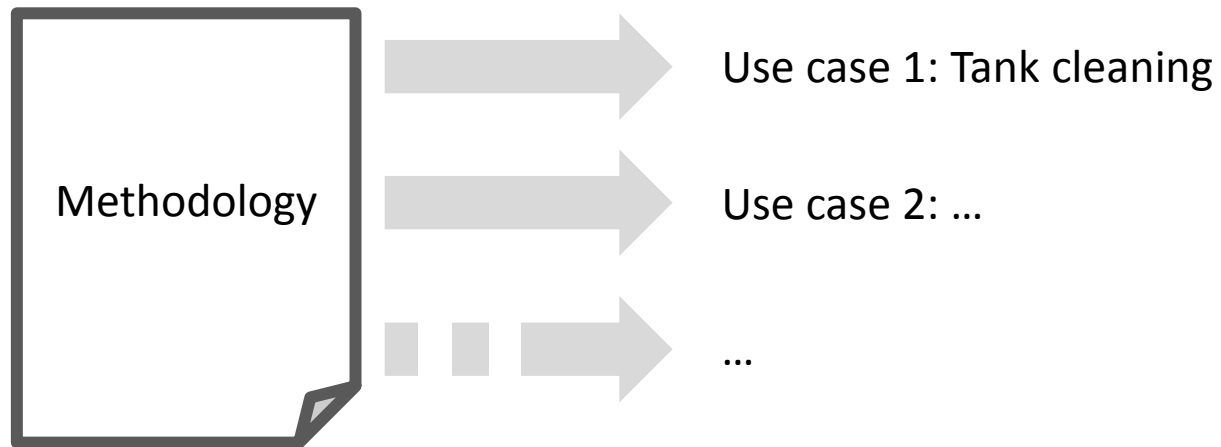


Reduce investment cost

INTRODUCTION

Pluridisciplinary team

- Ergonomics
- Cognitics
- Robotics

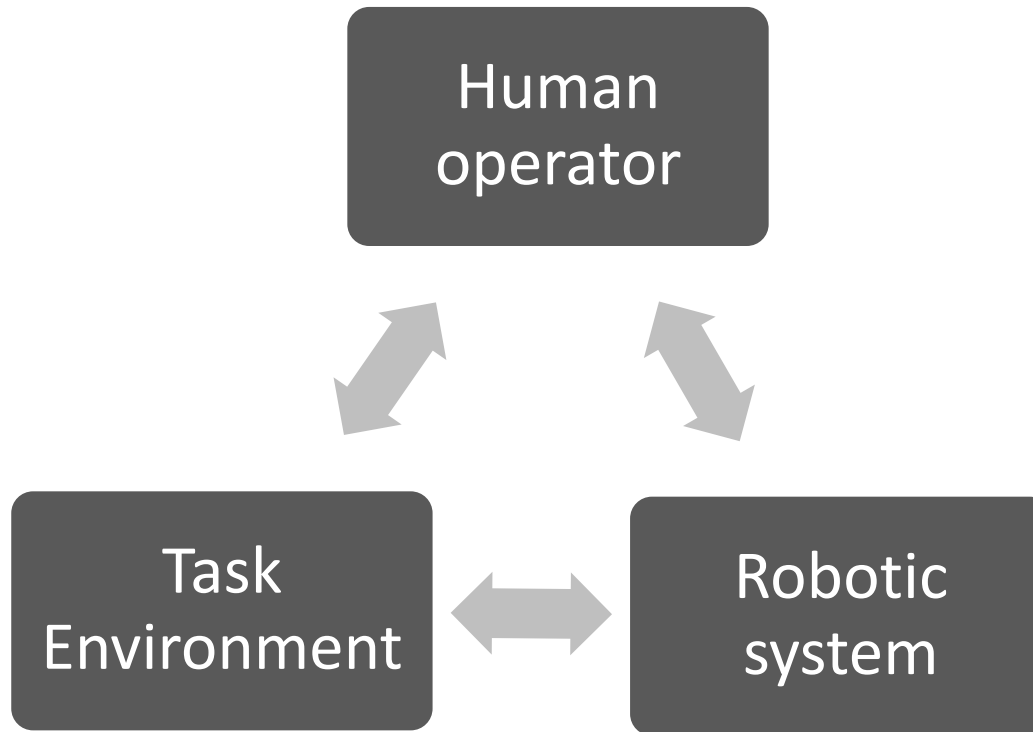




1 « Cobotization » methodology



Goal: help to design **cobotic systems**



Moulières-Seban T., Bitonneau D., Thibault JF., Salotti JM., Claverie B., « Human Factors Issues for the Design of a Cobotic System » AHFE 2016, Orlando, E.-U., juillet 2016



1 Preliminary analysis

2 Theoretical solution

3 Basic design

4 Advanced design

5 Industrialization



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Activity analysis:



Interview

Observations

Debriefing



Real operations



Formalization



1 Preliminary analysis

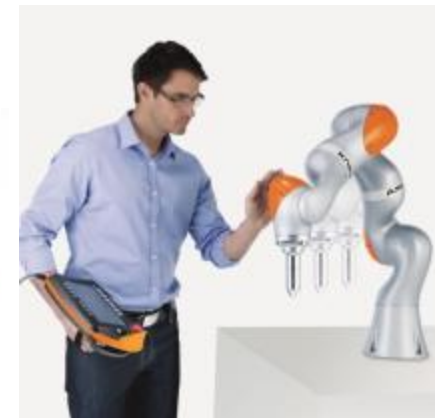
2 Theoretical solution

3 Basic design

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Technology review:





1 Preliminary analysis

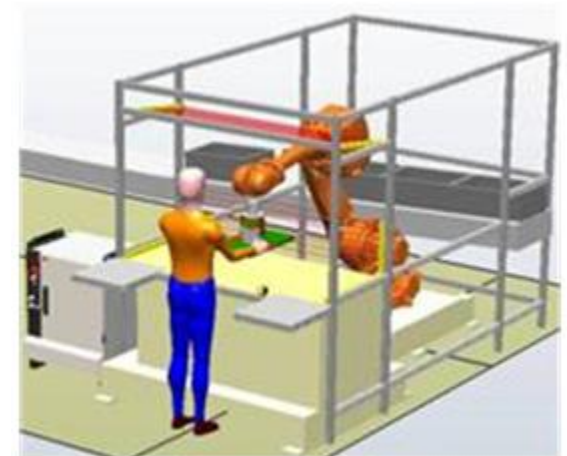
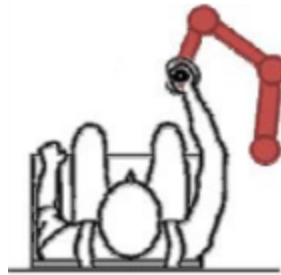
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Theoretical solution:





1 Preliminary analysis

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Simulation-based approach with the future users:





1 Preliminary analysis

2 Theoretical solution

3 Basic design

4 Advanced design

5 Industrialization

- *Technical specifications*
- *Setting up*
- *Teaching*
- *Certification*
- *Putting into service*



2 Use case: Tank cleaning





Removed pictures for confidentiality reasons



Goals:

- Improve working conditions
- Remote pyrotechnic operations
- Reduce cycle time



Tank cleaning interactive mockup:





Teleoperated scrubbing test:



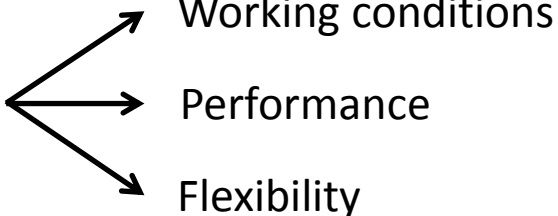

CONCLUSION

Methodology:

- Interdisciplinary team
- Including safety and normative aspects
- To be completed (industrialization step in progress)
- Currently tested through other projects

CONCLUSION

Cobotics:

- Benefits 
 - Working conditions
 - Performance
 - Flexibility
- Pyrotechnic workstations  Teleoperation

SPECIAL THANKS TO

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