NRI-CmmUS-LSU

NRI:FND: Collaborative Mobile Manufacturing in Uncertain Scenarios

September 2020 – August 2023
AWD#: 2024795

PI: **Corina Barbalata**, Mechanical and Industrial Engineering

CO-PIs: **Marcio de Queiroz**, Mechanical and Industrial Engineering
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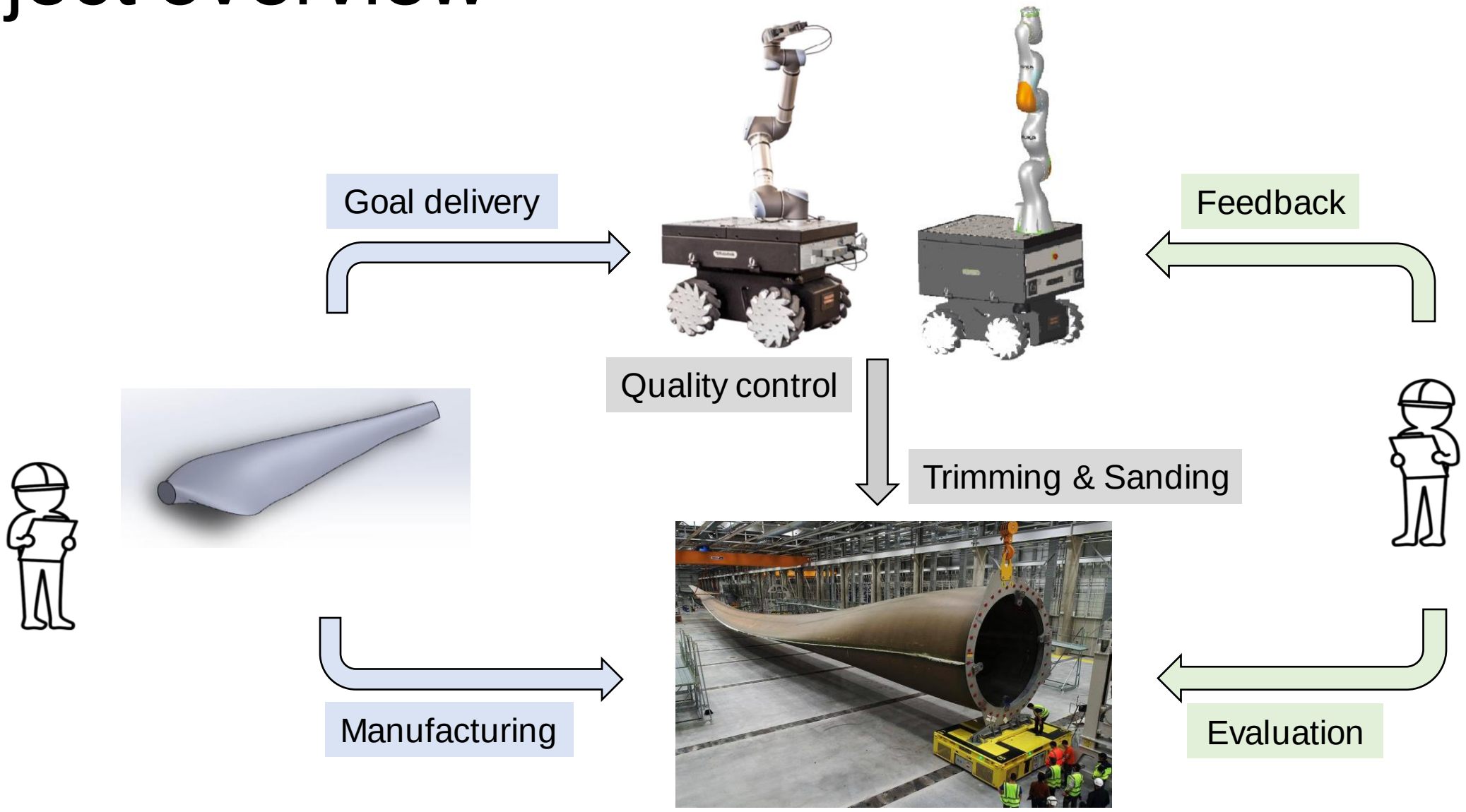
LSU

Project overview

Development of a scalable co-robotic system that leverages robot-robot collaboration with trained human supervisors for large-scale manufacturing applications, focusing on finishing operations for composite wind turbine blades.

Project overview

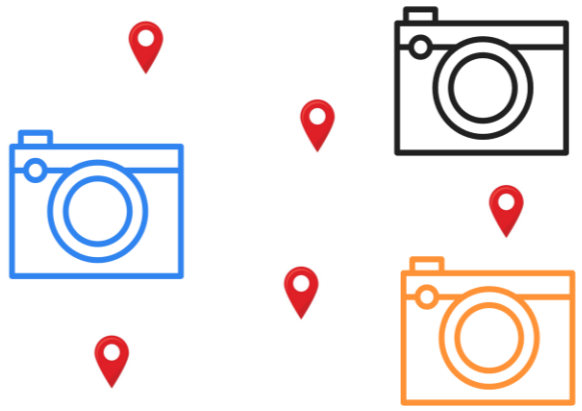


Control and Planning

- Integrated control-planning strategy for multi-agent systems for motion and interaction tasks:
  - ✓Decentralized strategy
  - ✓Viewpoints generation planning approach
  - ✓Receding-horizon control approach

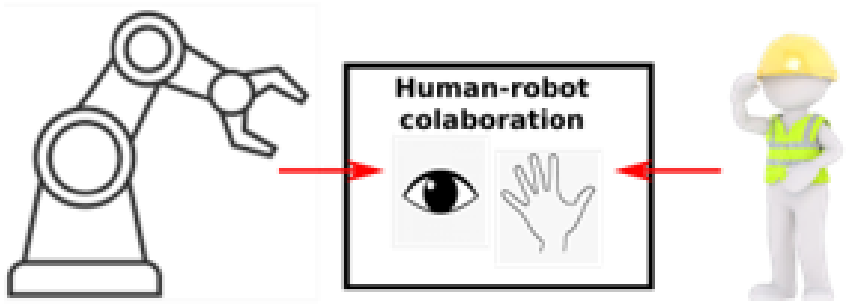
Sensing

- Development of multi-robot, multi-sensing capabilities for:
  - ✓Efficient, dynamic and real-time identification of critical surface features
  - ✓3D reconstructions
- Based on distributed RGBD/polarized-state-of-light perception systems



Human-robot coordination

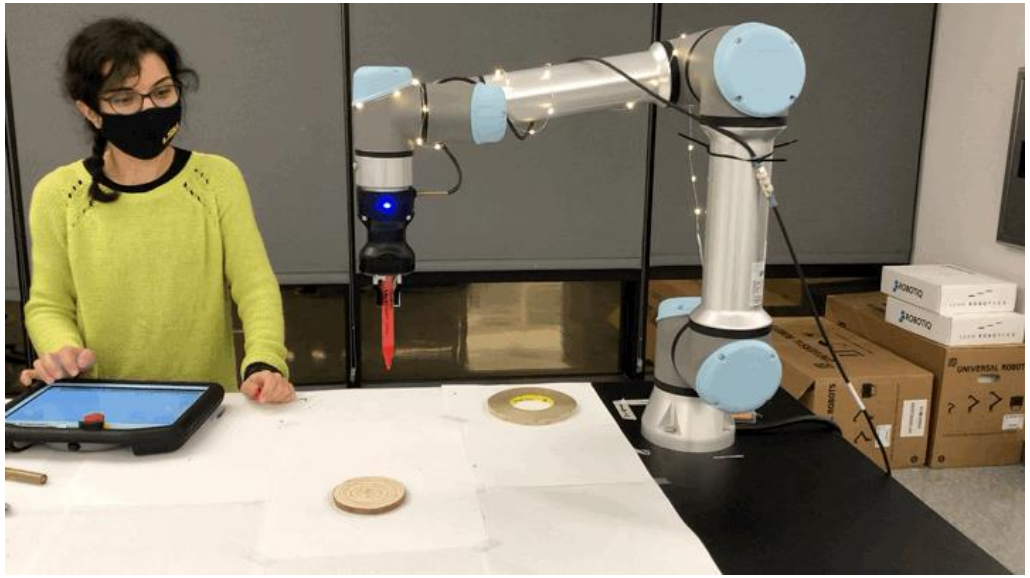
- Development of local-based evaluation methodology for task completion:
  - ✓Information gathered from robot understanding and human experience
  - ✓Combination of DNN algorithms and fiducial markers detection



Broader impacts

- Proposed architecture applicable to large-scale manufacturing in other industries: transportation, aerospace, maritime, construction
- Student training and development for job opportunities in robotics and next-generation composites manufacturing
- Promotion of human roles within dynamic collaborations with mobile robots

✓Project website:
https://nri-cmmus-lsu.github.io/dist/index.html



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