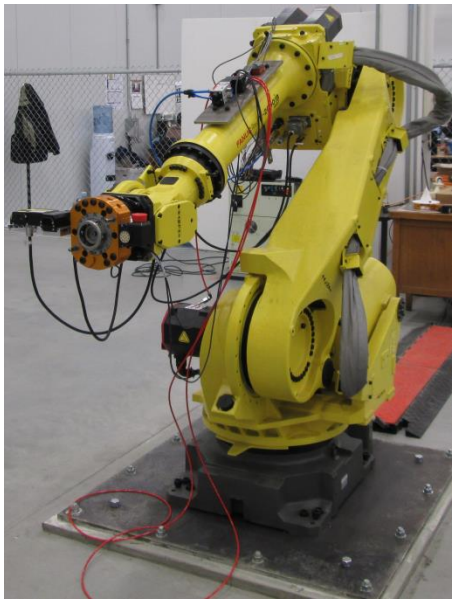
Thrust Area Working Group # 2 – Robotics and Automation

Steering Group Report – Meeting

October 23, 2013

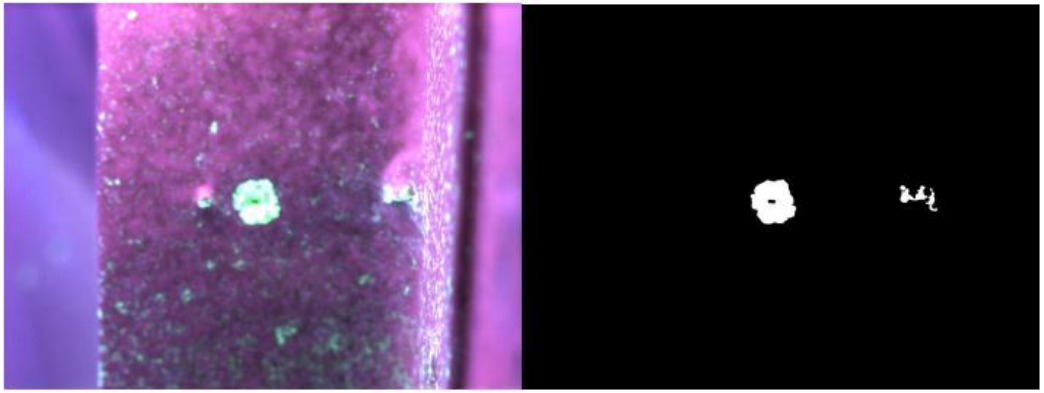
Enabling Technologies

- Robotic Assembly
  - FANUC 20000iB with vision and ATI tool changer



- Robotic Finishing
  - ABB IRB 5500 with Cartridge Bell System tool.

- Vision Systems
  - Liquid Penetrant Inspection with UV wave lengths filtered in.



Critical Enabling Technology – Robotic Assembly

Description

• Robotic Assembly and Automation in aerospace is playing an increasingly important role in order to remain globally competitive.

Timeline for Technologies

• Manitoba aerospace to close current gap that exists in the application of robotics to the assembly of aerospace product; 2 – 3 years.

•Intelligent sensing. Vision and tactile systems, sensor integration, data processing and object recognition; 2 – 5 years.

•Multi use end of arm tooling; 3 – 5 years.

•Self reconfiguring and learning systems; 5 – 10 years.

•Human – machine interaction; voice, gesture, haptic, wearable and neural; 8 – 15 years.

Critical Enabling Technology – Robotic Assembly(cont)

Cost to Implement – $9.5 M

- Initial setup - $ 3M
- $ 500 k per year for first 5 years.
- $ 800 K per year thereafter (5 years)

Manitoba's Role

- Collaboration with regional and national partners.

- Boeing, Magellan, StandardAero, Phantom Motion, University of Manitoba, Red River College, Industrial Technology Centre, National, Research Council, Polytechnique Montreal, McGill, Concordia, Ryerson, York, Centre Technologique en Aerospatiale, St. Hubert.

Risks if not implemented in Manitoba

The OEM's may seek other markets to manufacture their products. Manitoba could see a potential decrease in work being awarded and performed here.

Critical Enabling Technology – Robotic Finishing

MANITOBA AEROSPACE

Description

• Robotic Finishing in aerospace is playing an increasingly important role in order to remain globally competitive. Regardless of finishing type, the robot is a pointing device to allow the delivery system to discharge material. Such systems are currently available, but need to evolve in order to become efficient.

Timeline for Technologies

• Manitoba aerospace to close current gap that exists in the application of robotics to the finishing of aerospace product; 2 – 3 years.

•Intelligent sensing. Vision and tactile systems, sensor integration, data processing and object recognition; 2 – 5 years.

•Realtime data collection and processing, computer programming and algorithm development; 3 – 10 years.

Critical Enabling Technology – Robotic Finishing(cont)

Cost to Implement – $7.8 M

- Initial setup - $ 2.8M
- $ 400 k per year for first 5 years.
- $ 600 K per year thereafter (5 years)

Manitoba's Role

- Collaboration with regional and national partners.

- Boeing, Magellan, StandardAero, Phantom Motion, University of Manitoba, Red River College, Industrial Technology Centre, National, Research Council, Polytechnique Montreal, McGill, Concordia, Ryerson, York, Centre Technologique en Aerospatiale, St. Hubert.

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Critical Enabling Technology – Vision Systems

Description

• Vision guided robot control systems provide the ability to adjust position based on a comparison between preprogrammed data and vision captured data. Vision systems can be used for data validation or task execution; making the robot more efficient and semi intelligent. It allows a robot to adapt appropriately base on different situation.

Timeline for Technologies

• Manitoba aerospace to close current gap that exists in the application of vision systems for robotics, in support of manufacturing aerospace product; 2 – 3 years.

•Realtime data collection and processing, computer programming and algorithm development; 3 – 10 years.

Critical Enabling Technology – Vision Systems(cont)

Cost to Implement – $5.3 M

- Initial setup - $ 1.5M
- $ 300 k per year for first 5 years.
- $ 450 K per year thereafter (5 years)

Manitoba's Role

- Collaboration with regional and national partners.

- Boeing, Magellan, StandardAero, Phantom Motion, University of Manitoba, Red River College, Industrial Technology Centre, National, Research Council, Polytechnique Montreal, McGill, Concordia, Ryerson, York, Centre Technologique en Aerospatiale, St. Hubert.

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