A Vision of Future Machine Tools

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Blue Sky Competition
NAMRC 2023

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ICAMS
Interdisciplinary Center for Advanced Manufacturing Systems

Definitions

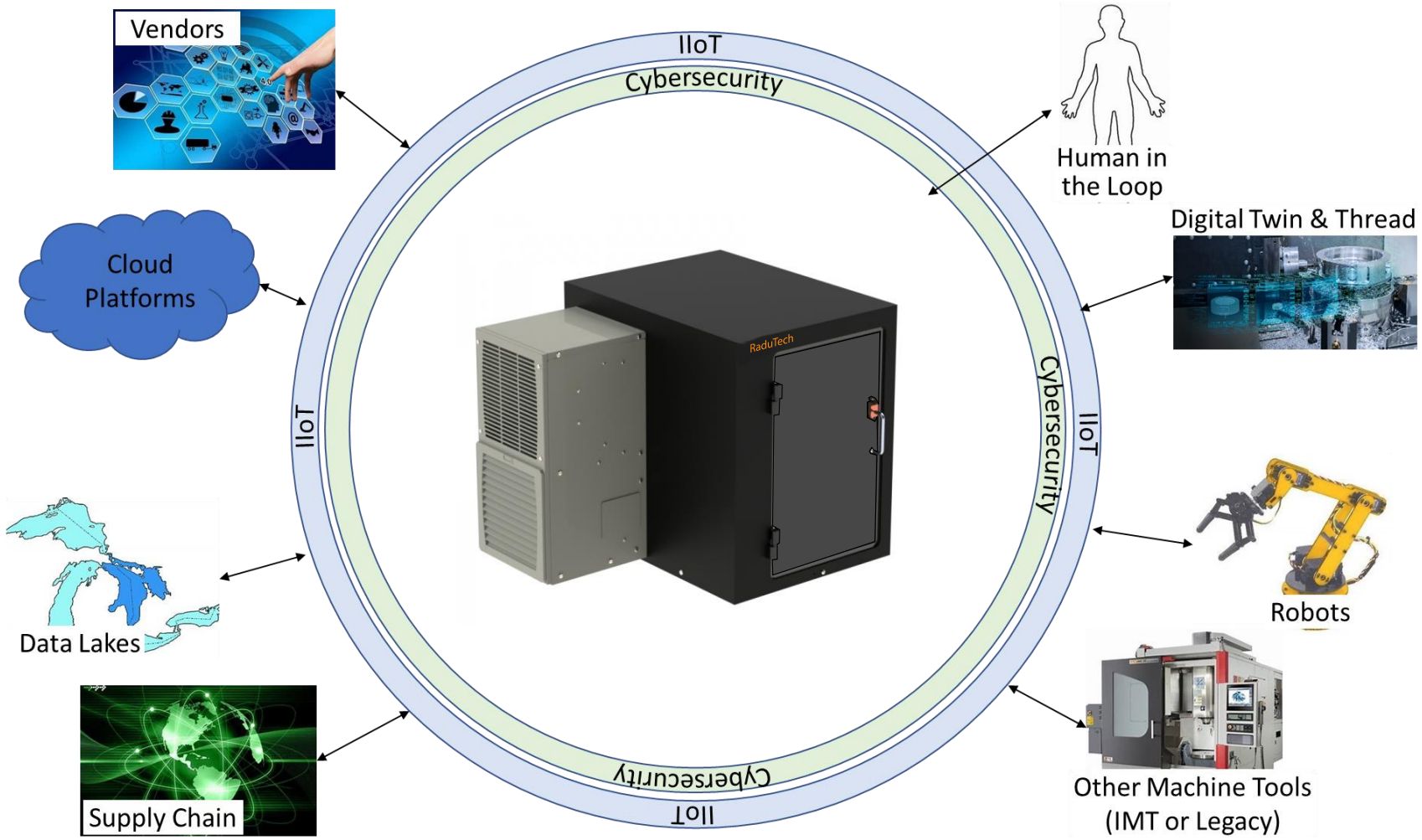
u•biq•ui•tous. Adjective. Present, appearing or found everywhere

la•tent. Adjective. Of a quality or state existing but not manifest; hidden or concealed

The future of Machine Tools is ubiquitous and latent AI.

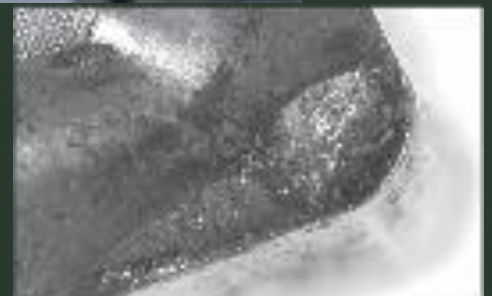
Introduction

The Vision



Like this one to show what is going on.

Introducing Carly



- Natural Language Interface
- Communicate Current Status
- Recall Part and Process Data
- Obtain Outside Information
- Virtual ERP-assisted Schedule
- Auto-contracting

Intelligent Scheduling

- Natural Language Interface
- ERP Access
- Machine Learning for Production Options
- Flexible, Secure Communications

Production Planning

- Virtual ERP Access
- Multiple Process Models
- Internet CFP with Encrypted Files
- Vendor Ranking
- Cyber Bidding and Contracts

Quality Revolution

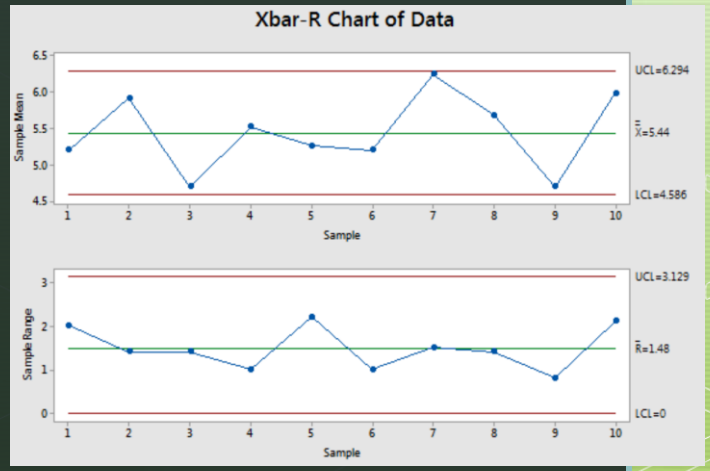
MSC Supply

ERP Access Reflects Speaker

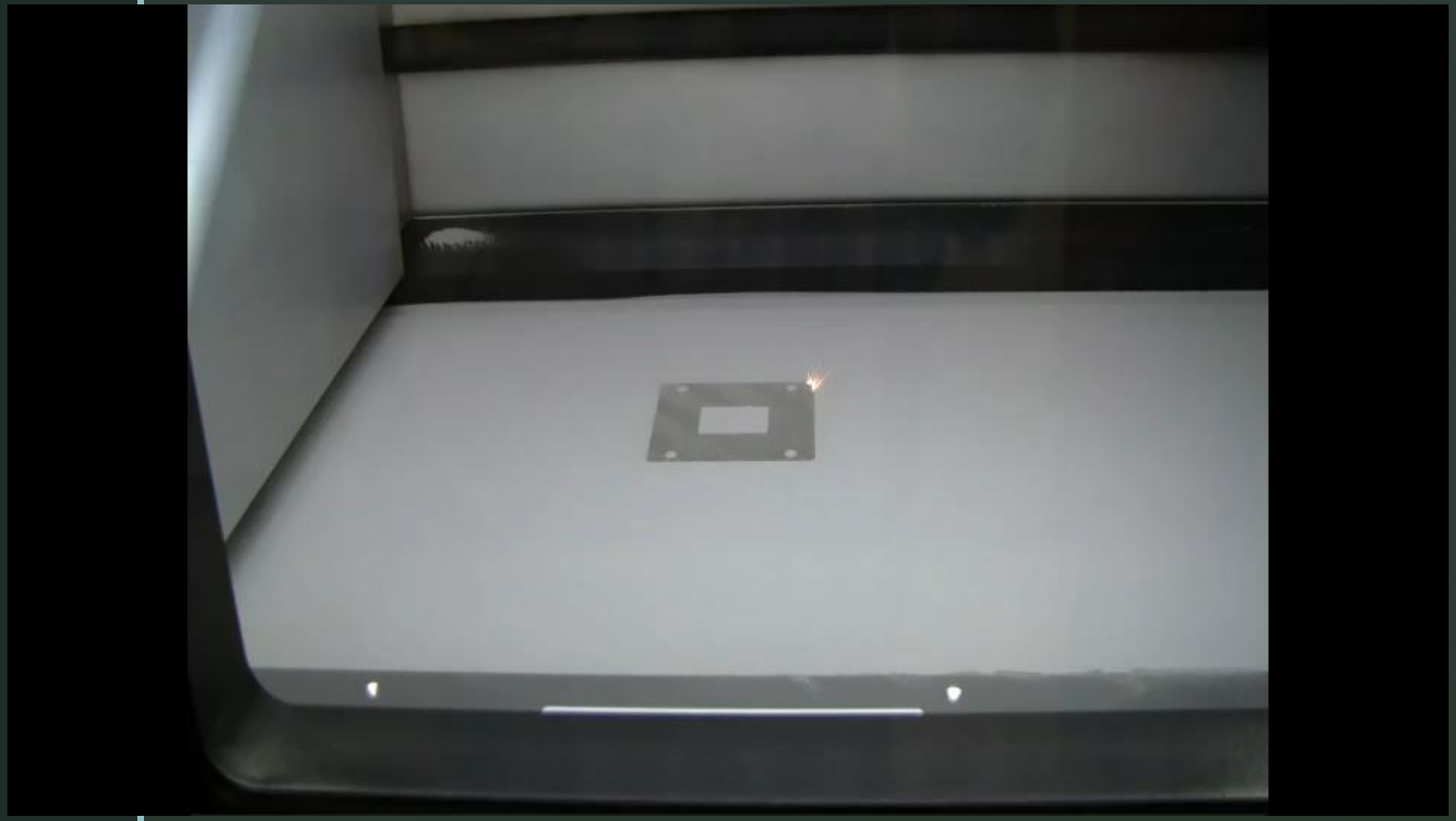
Digital Twins of Machines

Multiphysics Models – Suited to Preference

Scheduling and AI in Supply Chain



Hybrid Manufacturing



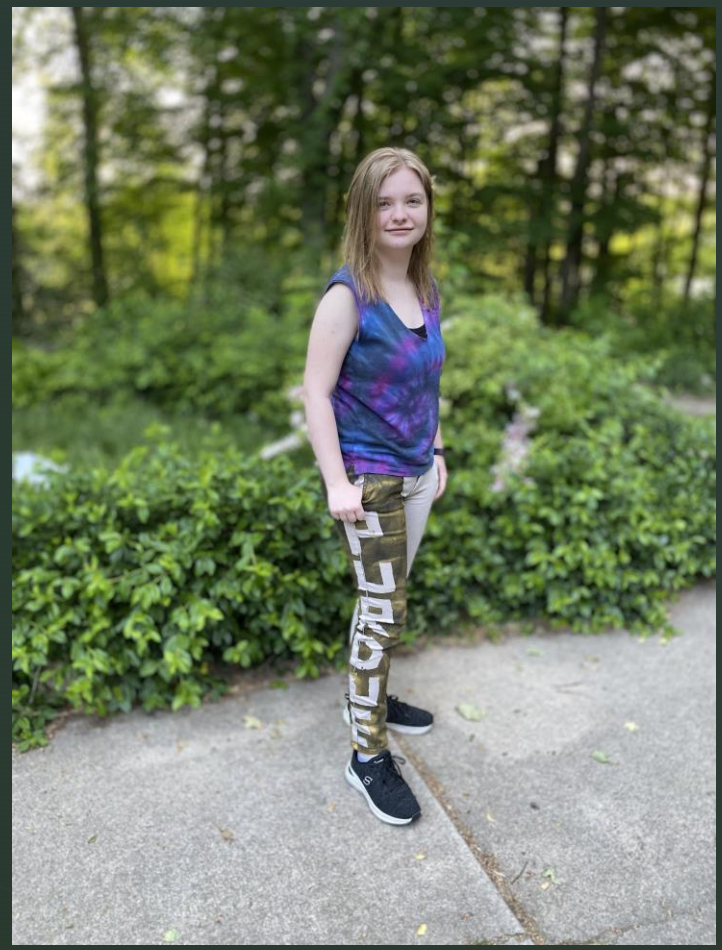
- Simulation-driven Process Selection
- Automation Used as Necessary
- On-Machine Metrology
- Quantum Processor

Summary

- The future of machine tools is strongly integrated with advances in computer science, including fields like Artificial Intelligence, Deep Machine Learning, Big Data, Communication and Cybersecurity.
- The trend is to simplify interfaces and to make additional tools latent and ubiquitous. Significant effort directed towards learning program operation are eliminated, but workers do need their base skills.
- Far from an archaic technology, machine tools are on the verge of a high-tech revolution. Funding in this area can dramatically influence worker productivity.

Acknowledgements

- Carly Schmid
- Joel Neidig & ITAMCO
- Jamie Goettler & MSC Industrial Supply
- Rob Caron & Caron Engineering
- NSF Blue Sky Program
- NSF Future of Manufacturing Program



Q & A

“The era ahead should be exciting for all people and we look forward to it with great enthusiasm.”

Dr. M. Eugene Merchant