AI + MANUFACTURING
The Power to Make Anything Anywhere Quickly

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July 11, 2019 Presentation to Congressional Manufacturing Caucus
World - Yesterday
World Today and Evolving
Smart Manufacturing

Physical World

Cyber World

Unprecedented access to data

Insights

Actions
Manufacturing = Networked Enterprise

- Collection of business processes
- Consists of many networks including
  - Design
  - Production
  - Distribution

(Source: Dr. Sriram, NIST)
Enabling Technologies

- Machine Learning/Neural Networks/Deep learning
- Computer Vision
- Natural Language Processing
- Speech Recognition
- Robotics
- Sensors/IoT
- Network Science
- Operating Systems
- Optimization
Main Challenge
Real-Time Prediction

Source: Ashok N. Srivastava, http://www.jklossner.com
Real-Time Decision Making
Manufacturing Supply Chains

Problem of Stable Matching - Search-Match-Connect
One to One Matching, Many to One Matching, Many to Many Matching

The market shifts from manufacturer oriented to customer oriented
Real-Time Decision Making
Scheduling

Now
Orders → Jobs configurations → Scheduling model → Optimum schedule

Future
IoT Data → ML Based Predictive models in the cloud → How long the machine will be down?

Optimum & Realistic Schedule based on AI
Real-Time Decision Making
Privacy-preserving Modeling
The Future
AI Enabled P7- Manufacturing Systems
Manufacturing of the Future

- **AI will facilitate**
  - Finding patterns faster from networked enterprises
  - Learning strategic, tactical and operational rules, and associated models
  - Enabling devices (including robots) and humans to co-exist and co-learn

- **Manufacturing 2030**
  - Future transformed manufacturing networks will have real-time accessibility and decision-making capability
  - This will enable quality manufacturing of what the customer needs, when they need it and where they need it.

P7-Manufacturing Networks