Human+AI Teaming Standards Roadmapping Panel

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NIST ENGINEERING LABORATORY

Human+AI Teaming Standards Roadmap | Agenda

I. Introduction — 11:00 - 11:15am
HMT (HAIT, HAT) its promise and pitfalls

II. The Panel Questions — 11:15 – 12:05pm
About 10 minutes per question, with a break/slido experience.
Panelists first, then audience.

III. Wrap-up — 12:05 – 12:15pm
Final questions, Slido results, conclusion.

Human+AI Teaming | Panelists

Our panelists

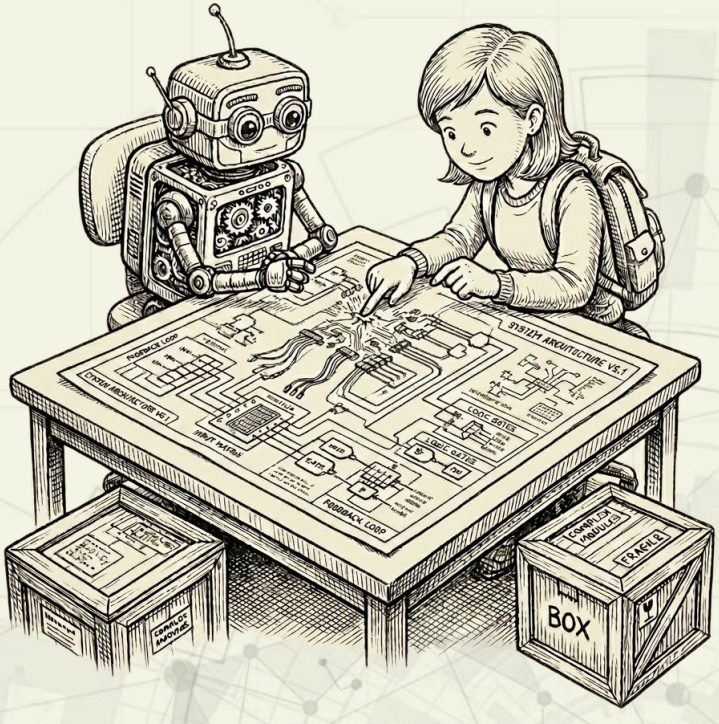
- Aoi Minamoto
  AI Systems Engineer (Controls Team), Toyota Battery Manufacturing NC,
  Founder & CEO, AImoji LLC
- Kyoung-Yun Kim
  Professor of Industrial and Systems Engineering, Wayne State University,
  and Fellow, SDPS.
- Arturo Casasa
  Principal Advisor for AI Strategy and Implementat at Texas Manufacturing Assistance Center (TMAC)
- Nobuhiro Hosakawa
  Technical Master & Quality Engineering Manager, IBM Research-Tokyo
  Convenor, ISO/IEC JTC1, SC42 WG4

Benefits of the HMT framework (SC42 AWI 25589)

- HMT framework provides:
  - An overall picture of the relationships between machines and humans involved in problem solving.
    - The five types of relationship cover all the patterns with humans and machines in symmetry.
  - A solution for deploying AI applications.
    - Combining multiple relationships
  - A dynamic view of the relationship between human and machine.
    - Evolution of teaming

My intro

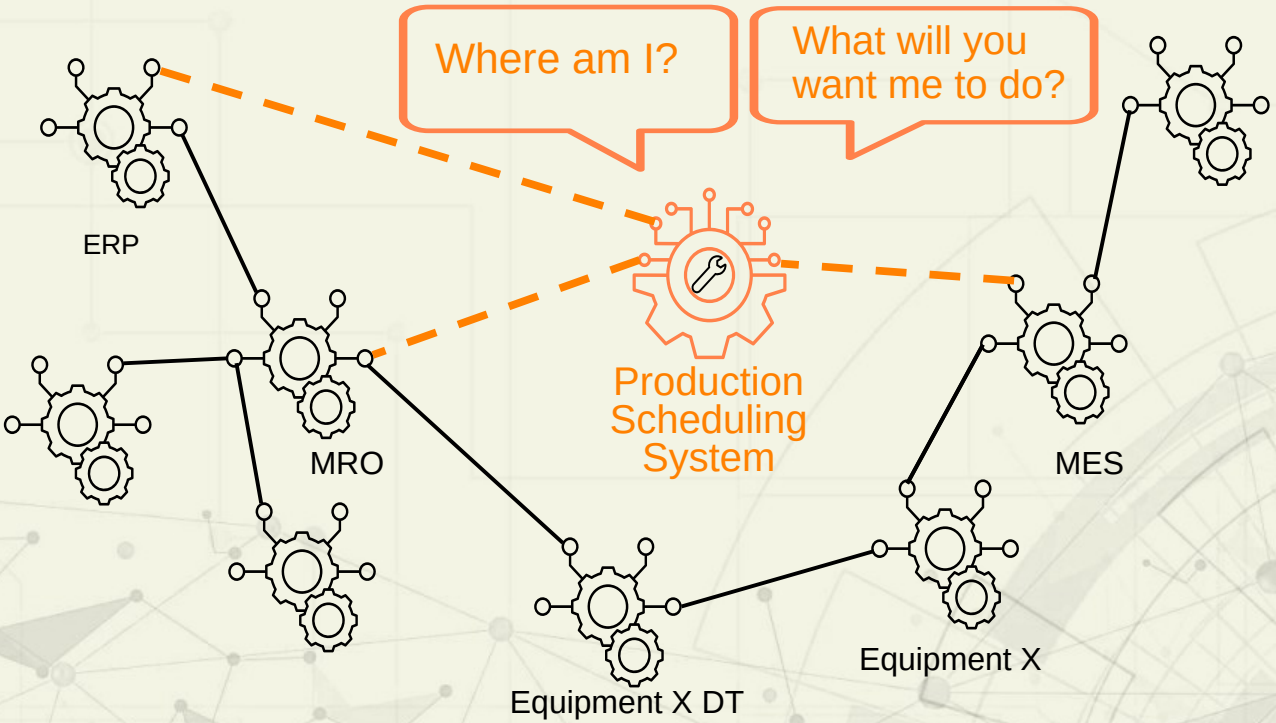
The most humanoid thing…



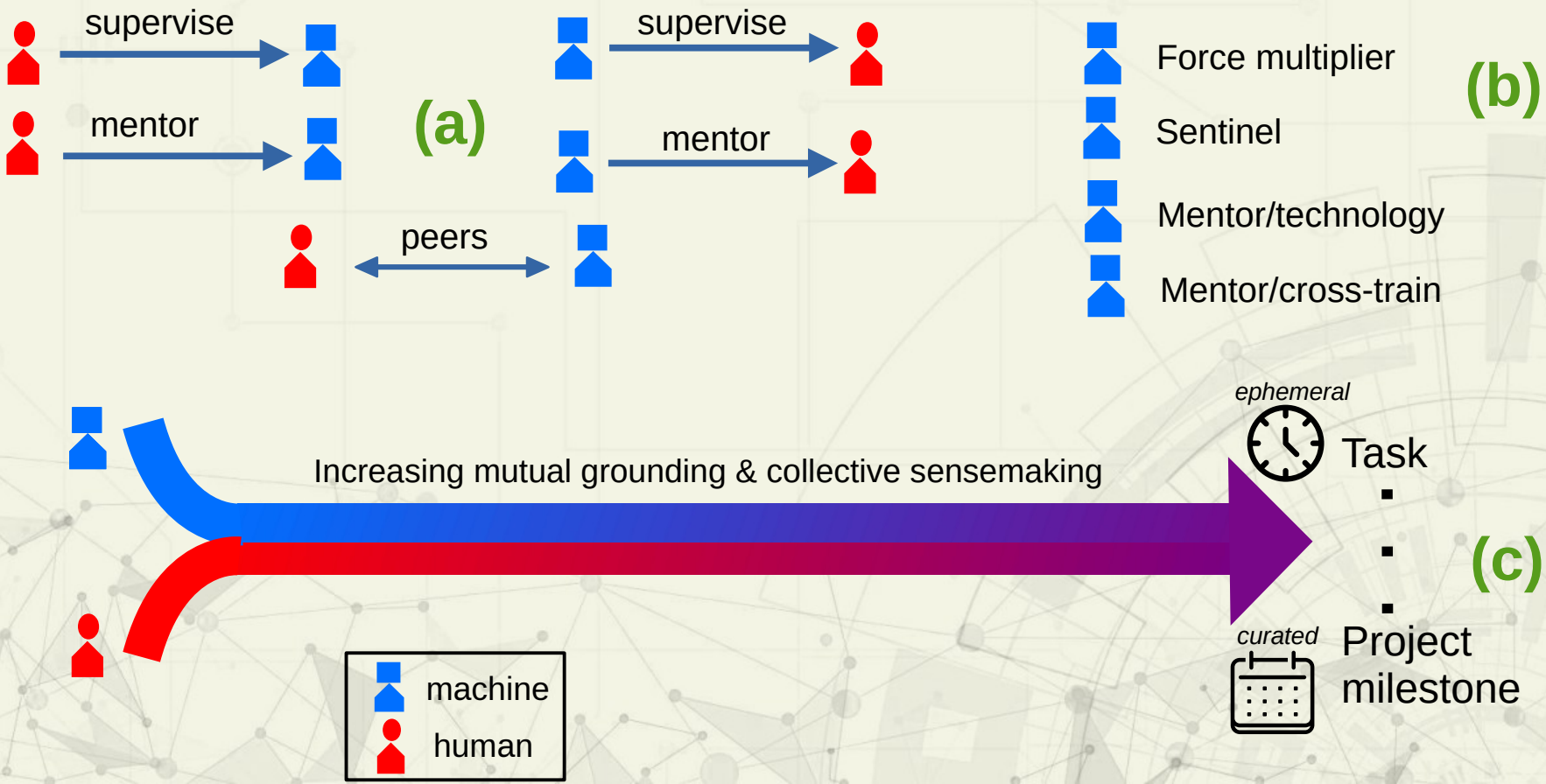
Domain Specific Languages (DSLs) are Conversation Starters!

- Example: Agent-led interviews resulting in translation of intent into DSL.
- Start simple (easy to understand)
- The DSL is executable, producing yet more to talk about.
- Iteratively refine the solution in the DSL, integrating mentoring along the way.
- Build trust by shared development.
- Participants as designers

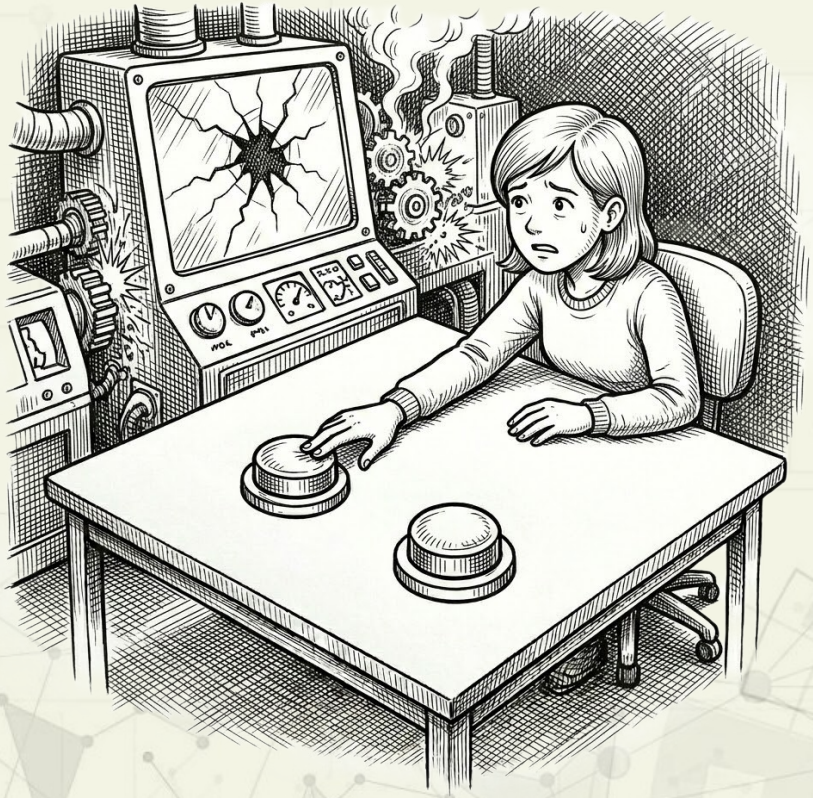
The broader use of conversation: SchedulingTBD Deployment Strategy



Teaming relationships (a), role (b) and temporal scale/persistence (c)



What gets lost when AI is only invisible elements of an automated process



Teaming Slido exercise

Here is a figure from Wynne & Lyons, 2019. Measurement science and best practice guidance could be pursued for *any* of the subjects listed in the blue boxes. Pick your top three.

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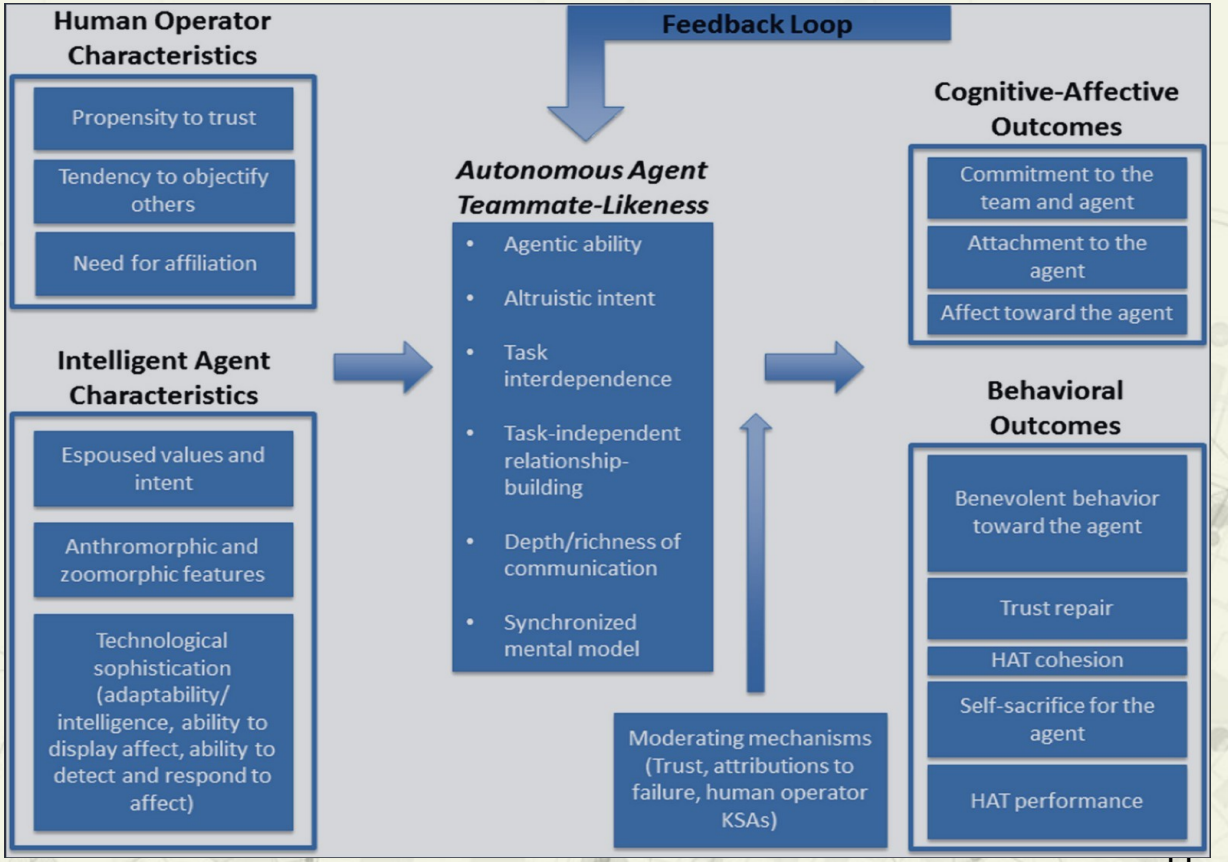


Wynne, K. T. & Lyons, J, B., *Autonomous Agent Teammate-Likeness: Scale Development and Validation*, Virtual, Augmented and Mixed Reality, Applications and Case Studies, 2019.

Questions for our panelists

Q1: What is different about manufacturing?

HMT research draws heavily from aviation, healthcare, and defense. Which lessons port directly to manufacturing, and where does manufacturing demand fundamentally different standards (different teaming patterns, different failure modes, different definitions of "team")?

Q2: Teaming, uncertainty, and manufacturing core competencies

Predictive maintenance, root-cause analysis, and quality decisions all require analysts to commit under uncertainty. How does the human-machine relationship shape that commitment, and where does it break down?

Q3: Tracking and trust

Agentic systems increasingly carry their own history (every model revision, every rejected hypothesis, every operator override). What would the provenance record of a human-machine team need to contain for you to trust the team's decisions?

Q4: Long-running teaming and fluid team composition

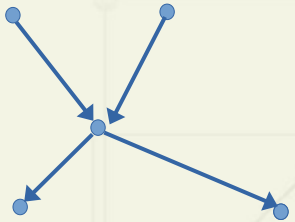
Traditional V&V happens at deployment, but HMT systems adapt continuously; the team you validated isn't the team you have six months later. What would a teaming-oriented framework for ongoing V&V look like in practice?

Q5: Artifact or processes?

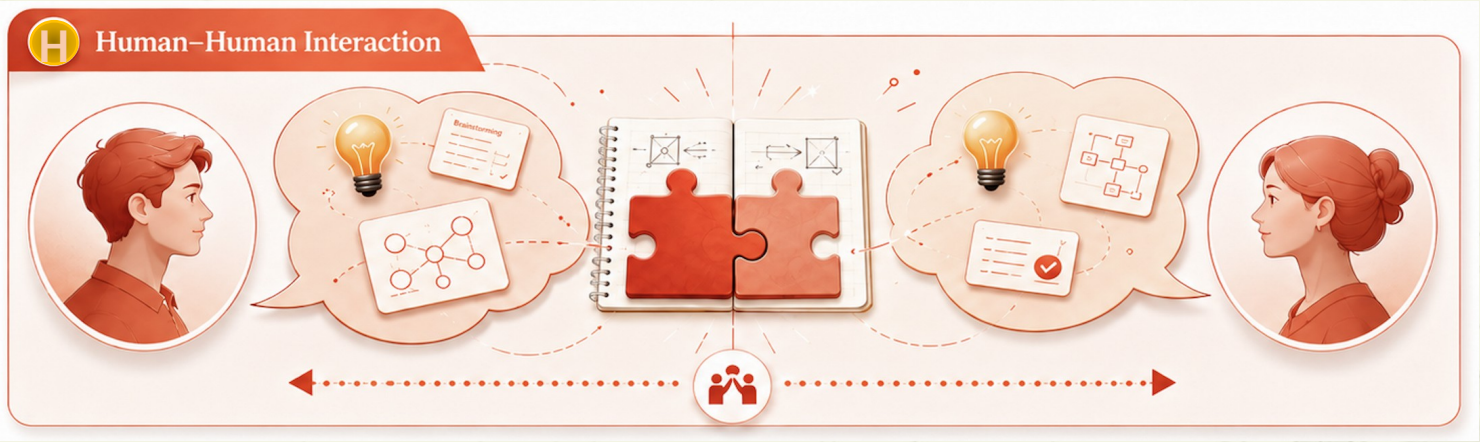
Should HMT standards prescribe **processes** (how a team collaborates in certain setting such as inspection, maintenance, etc) or **artifacts** (such as teaming-enabled digital twins, scheduling systems, etc.)

Conclusion

The substitution fallacy, past and present



Panelist Slides


Human–Human Interaction
Brainstorming


Human–Machine Interaction
Question / Inquiry
What is the impact of X on Y?
Intent / Goal
Analyze correlation between variables.
Prompt / Context
Dataset: Sales_Q1.csv
Region: Global
Analysis Summary
Strong positive correlation observed between X and Y.
Confidence
92%
Key Insights
Visualization
Recommended Action
Focus on variable X optimization.
Validation
Results verified against benchmarks.