2024 HART TG Member Conversations

Rolling Agenda and Meeting Minutes

Zoom Link:

Join from PC, Mac, Linux, iOS or Android:
https://asu.zoom.us/j/82914279163?pwd=QmRnZFdjN2hvZGU4M1ZSazFlYU5Xdz09
Password: 093725

Typical Meeting Agenda:

1. TG announcements (5-10 min):
2. Lightning talk, and Q&A and guided discussions (10+ 15 + 20 min);

Event Calendar 2024: Last Tue each month at 12 pm ET

Dates	Topics	Speaker	Affiliation
Jan 30, 2024	Center for Human, AI, and Robot Teaming (CHART): Capabilities and Opportunities	Dr. Nancy Cooke	Arizona State University
Feb 27, 2024	Reimagining Situation Awareness and Option Awareness for Human-Machine Teaming	Dr. Jill L Drury	MITRE
Mar 26, 2024	Human-AI Transportation Safety Teams: Examples and Challenges	David Moore	The U.S. DOT Volpe Center
Apr 30, 2024	Human Factors System Safety Requirement Development in Aviation AI Certification	Tia Larsen-Calcano	US Army
May 28, 2024	HAT in a Semi-Autonomous Vehicle Context	Maya Luster	Purdue University West Lafayette
Jun 25, 2024	The application of Shared mental models integrating Human and AI agents	Pamela Richards	University of Central Lancashire
Jul 30, 2024	Agreeing to Work Together: Working Agreements can help Shape Trust between humans and	Robert Gutzwiller	Arizona State University

	Automated Systems		
Aug 27, 2024	Real-time metrics for measuring the spread of trust and distrust in human-autonomy teams (HATs) and HAT constellations	Jamie Gorman	Arizona State University
Sep 10, 2024	HART TG Annual Business Meeting at HFES2024 (In person)		
Oct 29, 2024	Canceled		
Nov 26, 2024	Canceled		
Dec 31, 2024	Canceled		

HART TG Member Conversations 2023 (Archived)

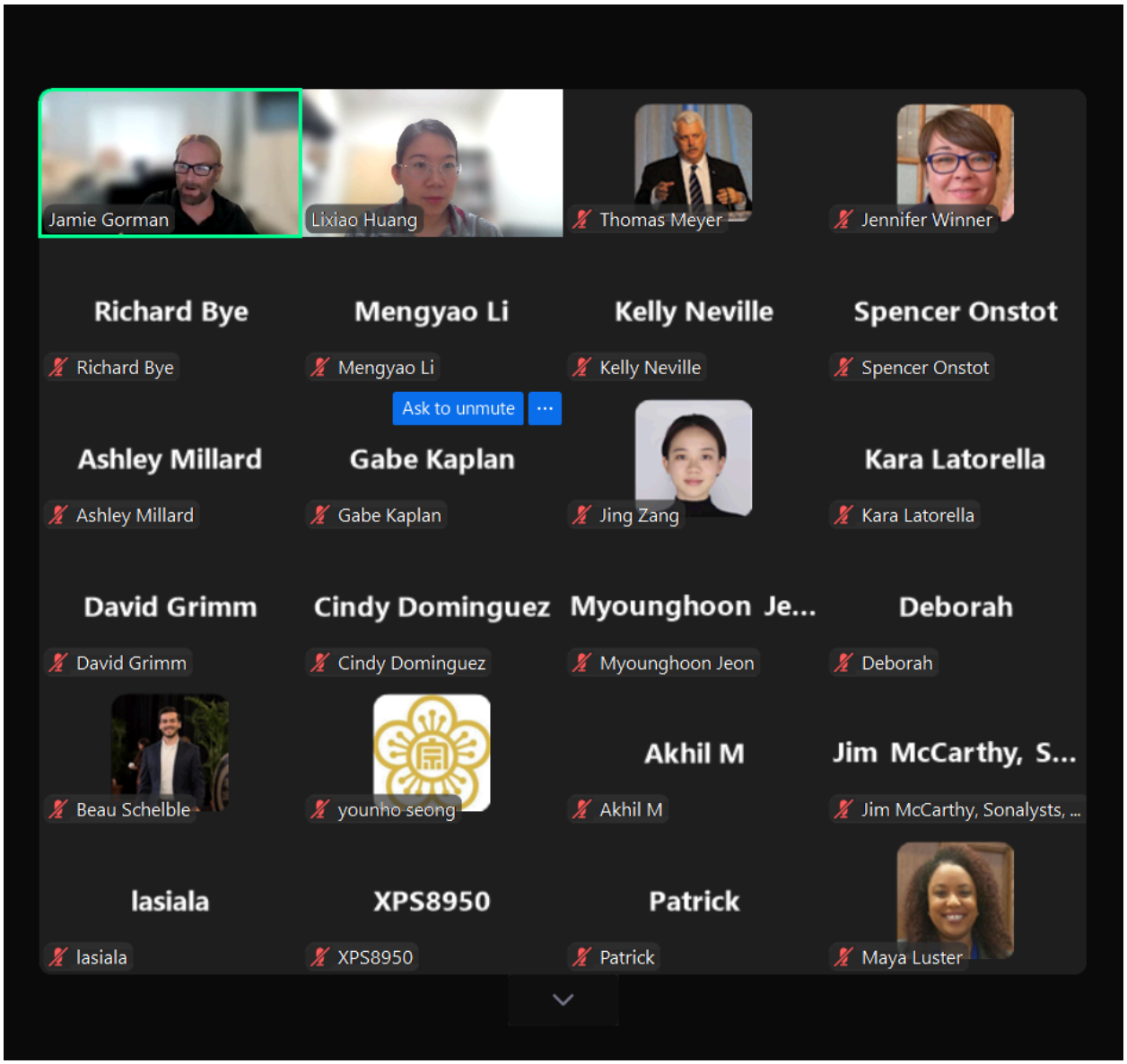
HART TG Member Conversations 2022 (Archived)

HART TG Member Conversations 2021 (Archived)

Aug 27, 2024 Jamie Gorman

Real-time metrics for measuring the spread of trust and distrust in human-autonomy teams (HATs) and HAT constellations

Attendees:

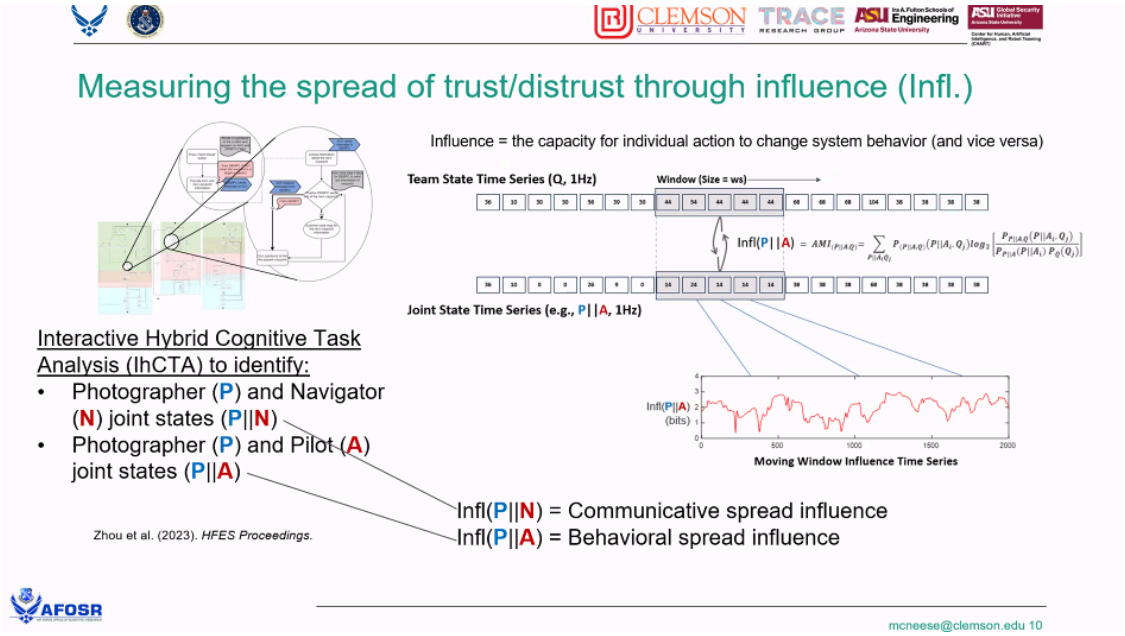


Agenda:

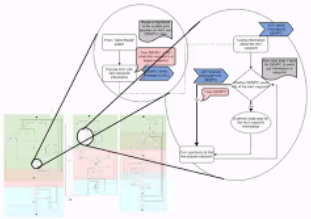
1. This will be our lat TG member conversation talk this year; we will have the business meeting on 9/24/2024.
2.

Minutes:

1. Jamie bio:
2. **Dr. Jamie Gorman** is a Professor of Human Systems Engineering and Director of the Center for Human, Artificial Intelligence, and Robot Teaming at Arizona State University. He is an expert in building generalizable models of human-automation team dynamics across various complex sociotechnical environments including medical, space, education, and military. He is an expert in using multimodal data to measure team interactions and predict subjective human states and system performance, including topics in adaptability, trust, resilience, and influence. His research is funded by DoD, NSF, and industry partners.



Measuring the spread of trust/distrust through influence (Infl.)



Communication, Interface, and Vehicle States [24 State Vector]

System State (**Q**) Time Series

Sensor #	Fixed Sampling Rate (e.g., 1 Hz)						
	1	2	3	4	5	...	*N*
q1	00000	00000	10000	10000	00000	...	00000
q2	00000	01000	01000	00000	01000	...	01000
q3	00000	11000	11000	00000	00000	...	11000
q4	00000	00000	00100	00100	00100	...	00000
...	...	...	...	...	...	...	...
q24	00000	00011	00011	00011	00000	...	00011
System State (Binary)	0000000...00	0000001...11	1000001...11	1000000...11	0000001...00	...	0000001...11
System State (Decimal)	0	286723	17064067	16777347	262208	...	286723

Interactive Hybrid Cognitive Task Analysis (IhCTA) to identify:

- Photographer (**P**) and Navigator (**N**) joint states (**P**||**N**)
- Photographer (**P**) and Pilot (**A**) joint states (**P**||**A**)

Intersection $q_i \cap q_j$ Time Series

q3	00000	11000	11000	00000	00000	...	11000
q24	00000	00011	00011	00011	00000	...	00011
q3∩q24 (Binary)	0000000000	1100000011	1100000011	0000000011	0000000000	...	1100000011
q3∩q24 (Decimal)	0	771	771	3	262208	...	771

Moving Window Influence Time Series

Infl(**P**||**N**) = Communicative spread influence

Infl(**P**||**A**) = Behavioral spread influence

Zhou et al. (2023). *HFES Proceedings.*

AFOSR

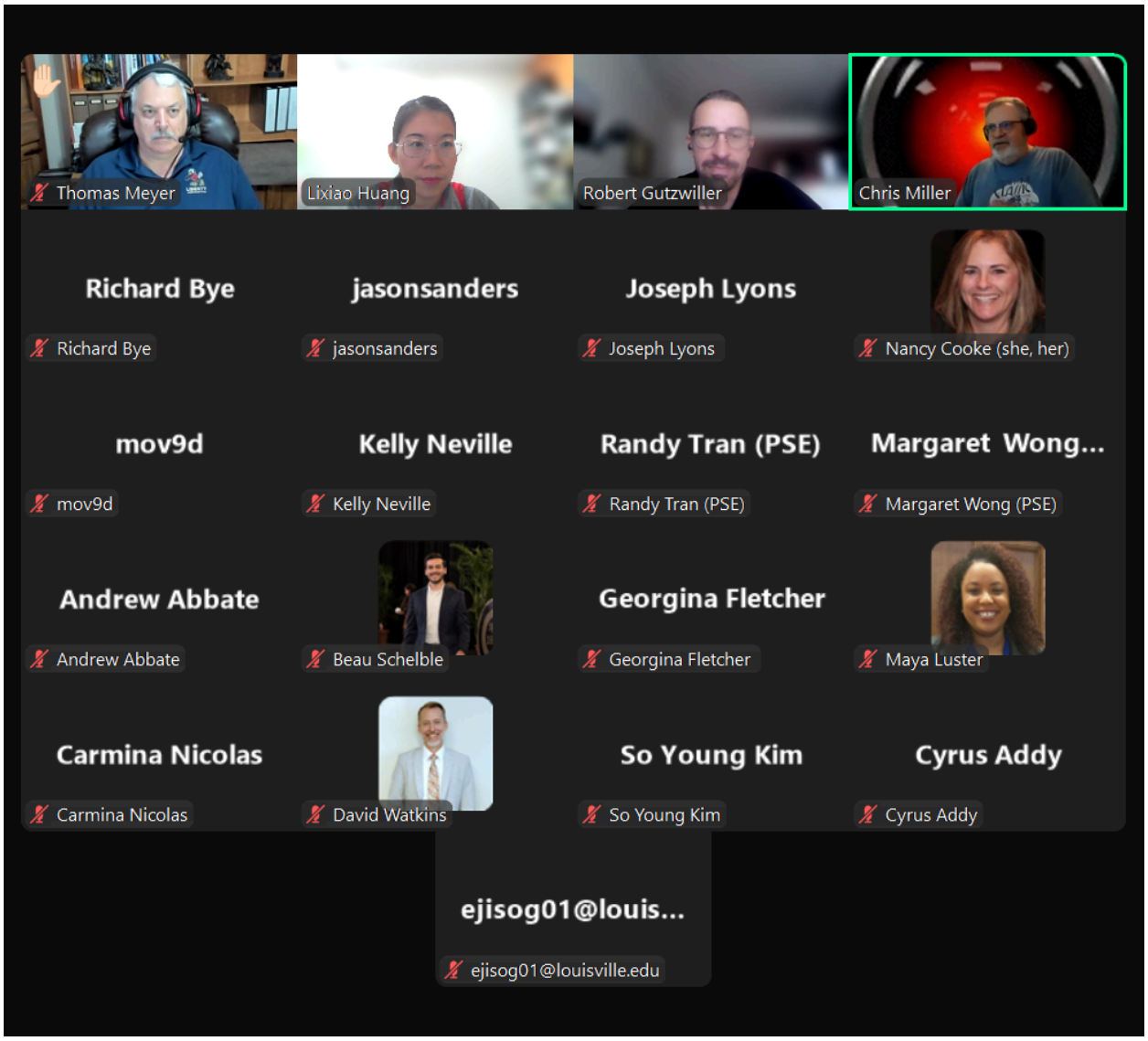
Summary of contributions

- Successfully spread trust and distrust within a HAT and across HATs through behavioral and communication spreading
  - Numerous significant findings using conventional measures (Performance, Process, Subjective Trust)
  - The novel dynamic trust spread measure indicates that trust/distrust spread through influence, which is linked to objective performance and subjective trust ratings
  - Trust dynamics also depend on whether behavioral and communication spreading match (i.e., both spreading trust) or mismatch
  - Empirical evidence of trust evolvement and trust/distrust spreading mechanisms based on rich qualitative insights
  - Human communicative trust spread is powerful, but only if it matches the behavior.
- Theoretical and methodological advances in understanding how behavioral and verbal trust spread within a human-autonomy team through influence
- Development and validation of a novel dynamic trust spread metric that can be implemented in HATs and multi-HAT systems to measure the spread of trust or distrust in real-time

AFOSR

07/20/2024 Robert Gutzwiller

Attendees: Lixiao Huang, Jason Anders, Tom, Nancy, Joseph Lyons,



Agenda:

1. Social and greetings between 11:50 am and 12:03pm
2. Introduction of the speaker: 12:03-05 pm

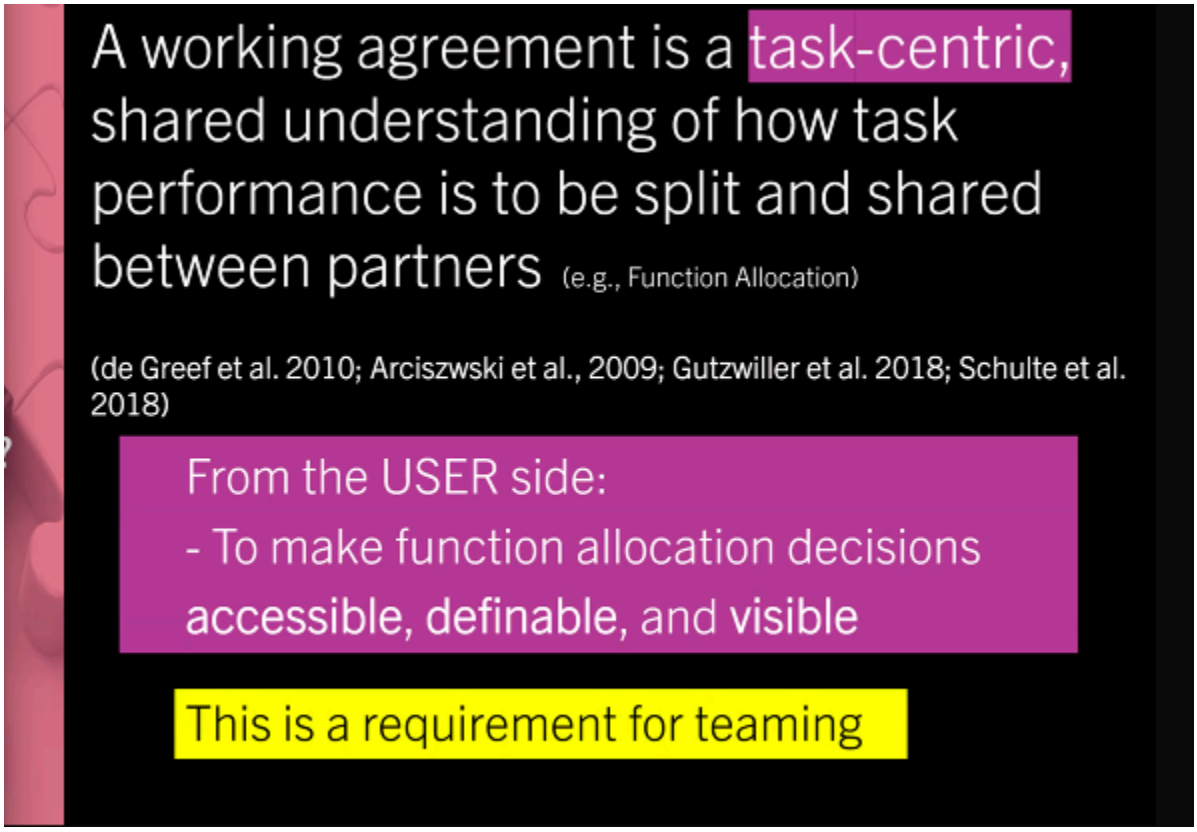
Bio: Dr. Robert S. Gutzwiller is an Associate Professor in Human Systems Engineering at Arizona State University. After receiving his PhD in Cognitive Psychology from Colorado State University in 2014, Robert accumulated research and management experience working for the United States Navy. He transitioned to a faculty position in Human Systems Engineering at Arizona State

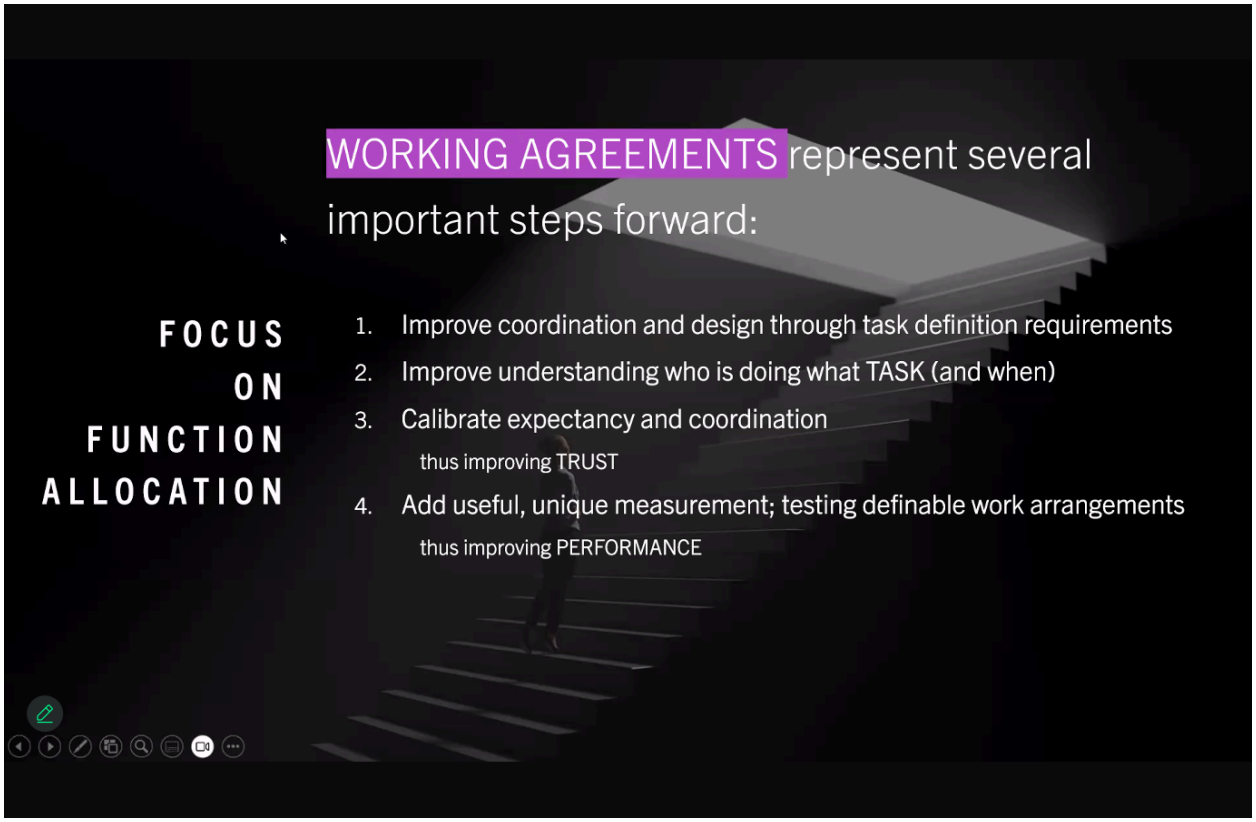
University in 2018. He currently serves as associate director of the Center for Human AI and Robot Teaming (CHART) at ASU. His work applies cognitive engineering to cyberspace, transportation, and defense. His recent research focuses on human-automation interaction (How do humans learn to interact with and trust complex systems, particularly those which use automation, artificial intelligence, and machine learning?), and studying cyberspace operations (How does a cyber analyst protecting networks develop awareness? Could cognitive techniques be used against would-be attackers to make defenses more robust? How can we build automated defenses that operators trust and understand?). Dr. Gutzwiller has been continuously funded by numerous DOD sources and is the author of over 58 peer-reviewed papers. He has received the *Jerome H. Ely* award and *Marc Resnick* best paper award prizes. He is also an avid cyclist, racing both off and on the road.

3. Lightning talk: 12:05-12:30 pm, Robert requested it to be 25 minutes this time;
4. Q&A and Discussions: 12:30 pm- 12:55 pm;

Meeting notes: [Feel free to add or edit things if any note is missing or incorrect.]

1. This talk is about task allocation.
2. The work started with an analogy of playing tennis among two vs. two. What if the human players are replaced by robots…
3.

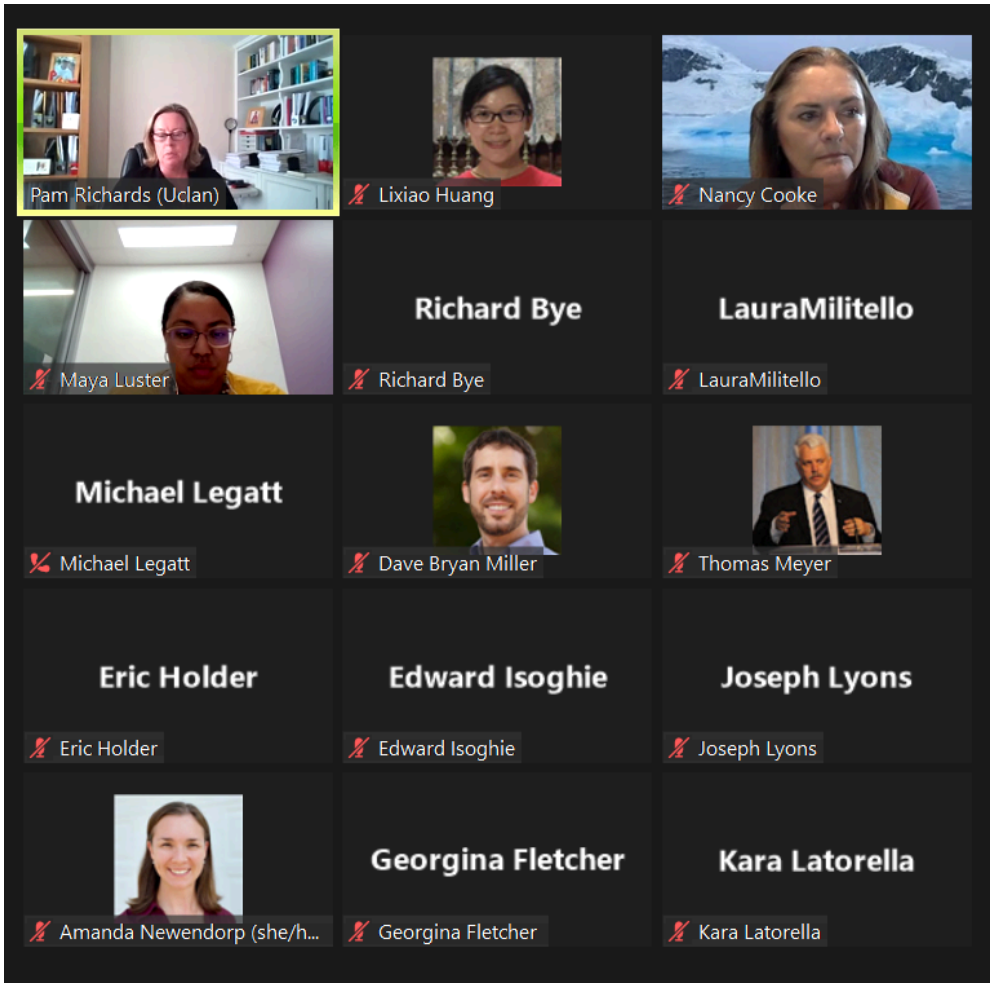




4. Q&A:
    a. How about relocation work?
        i. Agreeing to work together is an agreement that needs to be established ahead of time.
        ii. Follow-up question: How do we prepare for taking over the tasks? How do we establish the agreement for taking over tasks?
    b. Understand the reasons behind the surface, why did the agent do certain things and have certain reactions.
    c. **David Watkins** 9:42 AM At what point do we say that temporary team performance degradation is a good thing for future team performance? This could influence the dynamic/real-time updates to our working agreements.
    d. **Joseph Lyons** 9:50 AM This is great. I think these "working agreements" represent a form of teamming transparency - and one of the key gaps in HMT research is figuring out 1) how to establish these computationally, and 2) creating affordances for people and machine to jointly learn the fringes/boundaries of working agreements in order to build calibrated expectations of dynamic shifts of authority in context.
        i. Lixiao: Agreed. I am also thinking how do we establish the expectations and agreements. Would that be too rigid or can it have flexibility built in to the agreement.

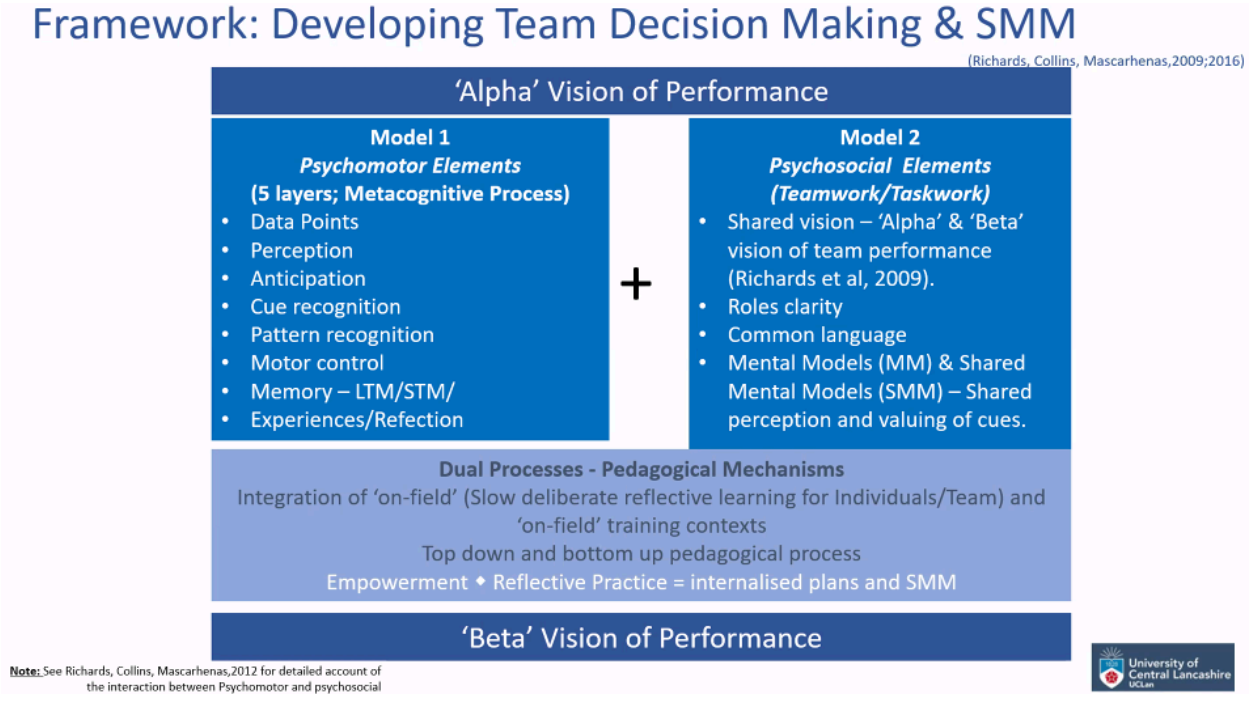
06/25/2024 Pamela Richards

Attendees: Pam Richards, Lixiao Huang, Pam, Richard Bye, Nancy Cooke, Michael Legatt, Dave Miller, Thom Meyer, Eric Holder, Edward Isoghie, Joseph Lyons, Amanda Newendorp, Georgina Fletcher, Kara Latorella,



Dr. Pamela Richards is an experienced applied researcher and consultant working in high pressurised team decision-making in complex and hyperdynamic naturalistic environments. Pam focuses specifically on Shared Mental Models and team metacognitions. She is a Reader (Associate Professor) in High Pressurised Decision-making and Interoperabilty at the University of Central Lancashire and the research strand lead for 'Developing Expertise in Individuals and Teams'. Pam leads a team of six doctorial students working in military decision-making, five students working in elite sport, and three students working in the emergency services. All doctorial students are focusing on high pressurised naturalistic team and individual decision-making in complex real-world settings. As a consultant and researcher, Pam advises across multiple domains, including Olympic and professional sports, military,

cyber and emergency services. Pam is a Chartered Psychologist (CPsychol), Associate Fellow (AFBPsS) and is qualified in Human Factors (Grad. CIEHF).



Five layers of decision making:

Team Decision Making Framework

(Model 1: Psychomotor)

Decision Making Development and progression of Team Decision Making					
Level Layer of Information	LAYER 1 Development of a Performance Vision	LAYER 2 Sport Specific Skill Set	LAYER 3 Tactical Development	LAYER 4 Strategic Development	LAYER 5 Actual execution of the performance vision
Engagement with the Coaching Process (what aspect of performance is developed)	1. Development of a performance vision ('alpha version) initially by the coach. 2. Division of the performance vision into smaller more manageable components of play. 3. Development of role clarity relating to performance vision. 4. Development of shared common language and team trademarks. 5. Development of principles of play.	1. Development of technical skills. Performance vision (Level1) shapes the refinement/ development of skills relating to MM associated with the performance vision. 2. Development of sport specific physical Skills. 3. Development of components 1 and 2 results in development of sport specific skills set. At elite levels this is playing position specific skill sets. 4. Recognition and construction -playing context dictates which cues are attended to and how MM are constructed. New MM are developed and existing MM are refined. 5. More cues (data points) are established to increase the understanding of complex situations (MM are updated). Additionally the number of variation relating to each playing situation increases. 6.Existing MM are questioned and then refined. 7. New MM are developed in context of established 'Frames'. Frames include perception of match/performance context, team philosophy, performance emotion and individual/team experience.	1. Performance vision shapes what environmental information players attend to in the performance setting. 2. Players are empowered develop a shared mental model of a specific aspect of performance - this establishes which cues (and data points) are attended to by the team in the playing context. 3. Existing SMM specific to the situation are updated through facilitating 'deliberate sensemaking' collectively as a team. Slow deliberate off-field environments shape on-field decision making. 4. Data is 'framed' - this is where cues in the playing environments are contextualised in context of the performance vision but also personal playing experience. Framing integrates elements such as the emotion of the player/ team (E.G. importance of the game) and also the characteristic of the match e.g. phase of the game (last 5 mins of play) etc. 5. Specific MM/SMM relating to playing situations are categorised according to characteristics of the situations. Decision making processes related to 1) play patterns which are recognised or 2) play patterns which are not recognised. E.G Attacking situations require a different DM process to defensive situations. 6. The performance vision is divided into smaller more manageable aspect of performance. Each individual aspect is developed collectively as a team (incorporating layers 1 & 2). Additionally each individual aspect of performance is divided into sub-phases. Through slow deliberate off field environments the players/team strength MM/SMM through simulation. Such activities increase the transference of decision making process to the competitive setting. 7. Performance cues (data points) need to be identified in the correct order enabling progressive layering. This facilitates the development of internalised plans	1. Development of MM and SMM increases the frequency and quality of individual decision making and collective decision making in the competitive setting. 2. Integration of on-field and off- field training environments helps project and anticipate future playing situations which are responded to in a co-ordinated team approach. 3. The integration of simulation through slow deliberate off-field environments combined with (playing experience results in connections being identified between related situations. Slow deliberate engagement) and experience results in new situations being resolved/responded to more quickly in the competitive context. 4. Team collectively engages in problem detections and are able to solve problems more quickly. 5. Teams question MM and SMM to predict and enhance future performances. 6. Framing of the competitive setting influences attentional focus of data points. The way the coach shapes the environment will influence the way players internalise the information.	1. Incorporation of Levels 1 - 4 into the coaching process results in the development and executions of the new 'beta vision' of performance. Vision is updated and continually refined during the programme. 2. Execution of the new 'beta version of the performance vision in the competitive setting - incorporation of coaching / players opinions.
	Sensemaking Note * The process of sensemaking in entwined in each level. Sensemaking enables new mental models (and shared mental models) to be developed. Existing models are refined and developed in level of complexity. The process of sensemaking involves the dynamic interaction of an individual's 1) Playing Experience 2) Emotions related to the situation 3) Knowledge of the performance setting 4) Physical development 5) Sport specific skill set				
	Bottom up Knowledge System	Knowledge Exchange Simultaneous Knowledge Exchange (Richards et al, 2009)			Top Down Knowledge System

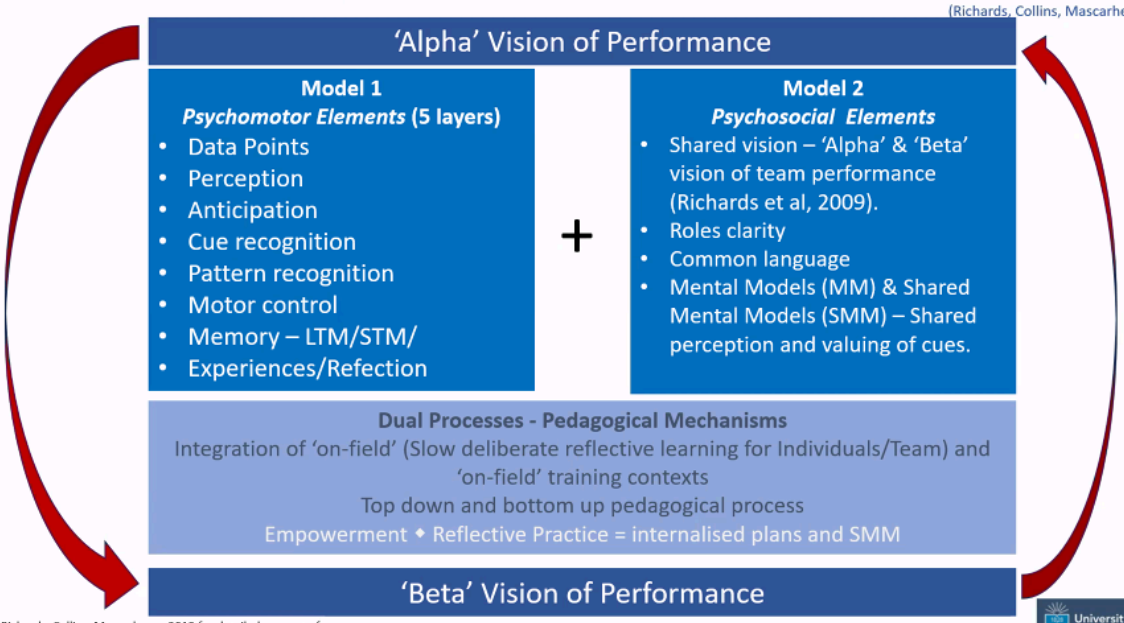
Figure 1. Cognitive layering of knowledge structures: A framework for the development of team decision-making.

Richards et al, 2016 p 5

University of Central Lancashire

Framework: Developing Team Decision Making & SMM

(Richards, Collins, Mascarhenas,2012)



Note: See Richards, Collins, Mascarhenas,2012 for detailed account of the interaction between Psychomotor and psychosocial

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Examples of SMM #1: World Cup Netball *(Centre Pass: 4 – 7 seconds)*

	DAY 1 - Training Game 1	DAY 4 - Training Game 4	DAY 26 - International Game 1	DAY 27 - International Game 2	DAY 30 - International Game 3	DAY 31 - International Game 4
% centre passes to shot	45	44	65	59	73	78
% centre pass to goal (inc rebounds)	26	37	41	38	61	56
WORLD CLASS CENTRE (no rebounds)	23	19	24	32	52	56

Figure 3 - Time series to illustrate the development of connective play through the application of SMMs developed over the 31 day process (World Cup Campaign).

Richards et al, 2012

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Key Terms of significance relating to SMMs:

Alpha Model

The establishment of the shared performance vision (SMM) which enables information to be transferred and integrated from a top-down knowledge process (alpha performance vision) and a bottom-up knowledge process integrating MMs and SMMs of all individuals simultaneously (Richards et al., 2016). It is these two interactive processes, which are instrumental in shaping the development of SMM.

Heterogenous Accuracy

Understanding of knowledge relating to own role.

SMMs

Beta Model

The incorporation of individual team member's perspective (and/or sub-unit) which informs and reshapes initial strategic vision (alpha version) and results in the construction of the new final beta version (bottom-up approach) which is operationalised (Richards, et al., 2016).

Inter-positional Accuracy

Understanding of teammates roles (including role in the task)

daden Strong INEVITABLE

Human Autonomy Teaming for Adaptive Systems (HATAS) Grid

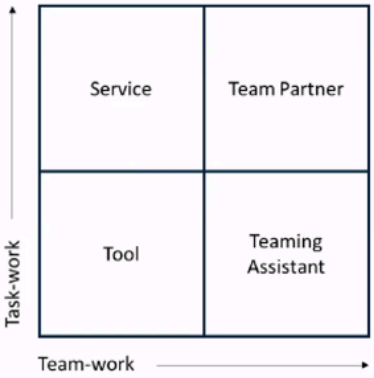


Figure 8: Team-work vs Task-work Grid (Farry, 2022, p. 6)

Tool: A system that has low or no task-work and team-work ability and is used to provide a desired state.

- Autonomy by the tool is narrow and it is only focused on the function it has and will not change to external context or the task. E.g., facial recognition that categorises.
- Started on human request
- Minimal human interaction.

Service: A system that is aware of task-work but not team-work.

- Services will carry out a taskwork when requested / or progress a task.
- Services will change activities in response to the state of the task but will not changes in in response to the state of the team. E.g., services will change in relation to changes in targets, geographical areas but not in relating to understanding human fatigue etc.
- E.g. services are things that can suggested departure times or routes based on patterns of behavior.
- Analyses changing data
- Not aware of team state, dynamics or wider task - so information timing, level and even focus may be inappropriate

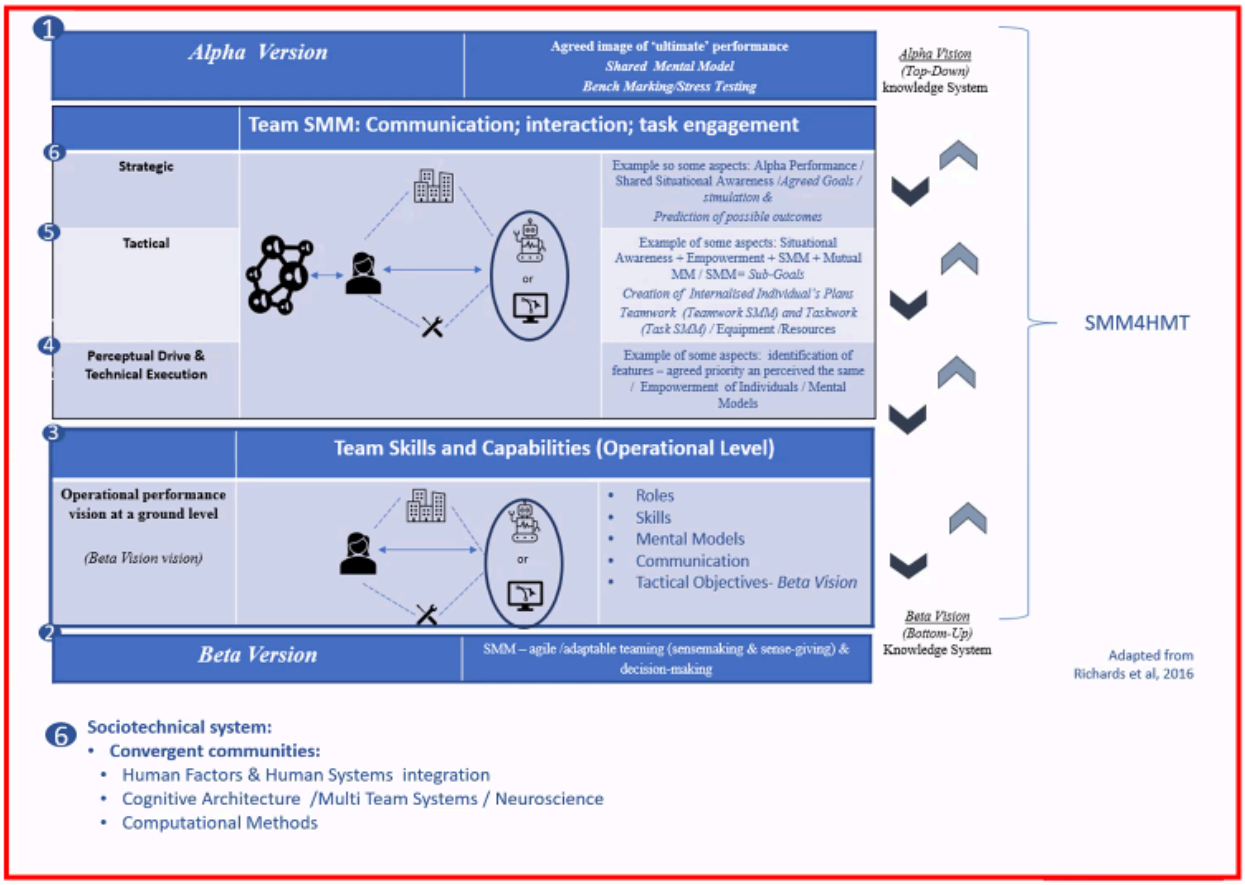
Teaming Assistant: A system that is team-aware but has limited or no task-awareness.

- It supports the wider team by improving teamwork.E.g. it will schedule tasks across the team members adapting factors to match their experience an current level of work, offers advice, record keeping and manages resources.
- Focus on the team state and dynamics not the task

Team Partner: A system that is both task-aware and team-aware.

- Combines elements of both a Service and a Teaming
- More what we'd expect a good human team-player a

dstl daden University of Central Lancashire Strong INEVITABLE



Shared Mental Models for Human-Machine Teaming (SMM4HMT)

"If we want the human-machine teams and human-agent collectives of the future to perform at the best of their ability, then we must learn how to develop Shared Mental Models (SMM) between humans and machines. "

[dstl] The Science Inside daden University of Central Lancashire UClan Strong ENTERPRISES INEVITABLE

Key Hypotheses

- Using co-operative board games as an analogue for medium/high intensity teamwork situations
  - Pilot work and proof of concept.
  - Adaptations of Team Decision-Making Framework and method using CTA (Richards et al., 2012; 2016) for data capture, develop machine/AI players,
- **H^1 - Are manual co-operative boardgames a suitable environment in which to conduct research on shared mental models in human teams?**
- **H^2 - Are shared mental models operationalised in co-operative boardgames?**
- H^3 - Can AIs be developed to play co-operative boardgames?
- H^4 - Can AIs be developed to play co-operative boardgames as part of human-machine teams?
- H^5 - Can processes, mechanisms and patterns of engagement employed by humans in co-operative boardgames be utilised in the context of AI/SMM in human-machine teaming?

In the middle, it was mentioned that the studies used board games. How do we collect real-time engagement data?

Results (High Level): Level 1 Team CTA (Richards et al., 2009; 2012; 2022)

H^1 - Are manual co-operative boardgames a suitable environment in which to conduct research on Shared Mental Models in human teams?

Table 3 - Thematic analysis of CTA (Sheets and Observations) (Level 1 analysis)

Themes		Sub-themes	Dimensions (SMM / Shared Decision Space)
1 Boundaries	1.1	Alpha vision – winning the game	
	1.2	Social (Framing)	
	1.3	Individual (Framing)	
	1.4	Pushing Boundaries	
2 Course of Action	2.1	Keep Moving	
	2.2	Agreed Prioritisation of COA	CUES
	2.3	2 Moves ahead strategy	
	2.4	Types of Moves	
	2.5	Satisfying	
	2.6	Consider the number of turns left to use	BIA-DIRECTION COMMUNICATION
3 Resources	3.1	Keep Resources	
	3.2	Keep Resources and bank them even if needed for the future.	
4 Roles (Individuals)	4.1	Current status (Role / health)	
	4.2	Persuade others of ideas	
	4.3	Special roles v Task leader role (at that time	
5 Decision making	5 .1	Connected decision points	SHARED AWARENESS
	5.2	Recognised decision points	
	5.3	Recognise Critical Decision Points	
	5.4	Recognise Critical Moments	
	5.5.	In the moment decision-making	
6 Leadership	6.1	Task leadership	
	6.2	Strategic leadership (in context of alpha)	
7 Silence	7.1	Reflection	
8 Evaluation	8.1	Team Metacognition Linked to overall alpha vision	
	8.2	When no solution is visible – live in the moment	

Section summary:

- H^1 was accepted
- *SMM in strategic boardgames require the integration of multiple components (n=8); connected to three dimensions which are relevant for HMT.*
- *Factors relate to 1)cues 2) situational factors; 3) physical features and 4) context of the situation 'in the moment' (Beta vision); which all sit in context of 4) the alpha vision of the game.*

Implication of AI and SMM4HMT:

- *SMM could, possibly, be a mechanism which exists in a **shared decision-space for HMT** when playing boardgames; therefore, enabling collaboration.*

Results (High Level): Level 2 Performance Analysis

H^2 - Are Shared Mental Models operationalised in co-operative boardgames?

Method:

- 14 categories of codes were identified.
- Data was analysed at multiple levels including:
  - Individual player level (Cognition);
  - Team metacognitions (Problem solving; evaluation, decision-making etc.);
  - Teamwork;
  - Taskwork;
  - Game profile level – normative and comparative.

- 71 performance indicators were used to codify the data (Literature review and Level 1- Inductive).

- *Performance Indicators were linked to operational definitions.*

Figure 10 Tag set with performance indicators

Results (High Level): Level 2 Performance Analysis

H^2 - Are Shared Mental Models operationalised in co-operative boardgames?

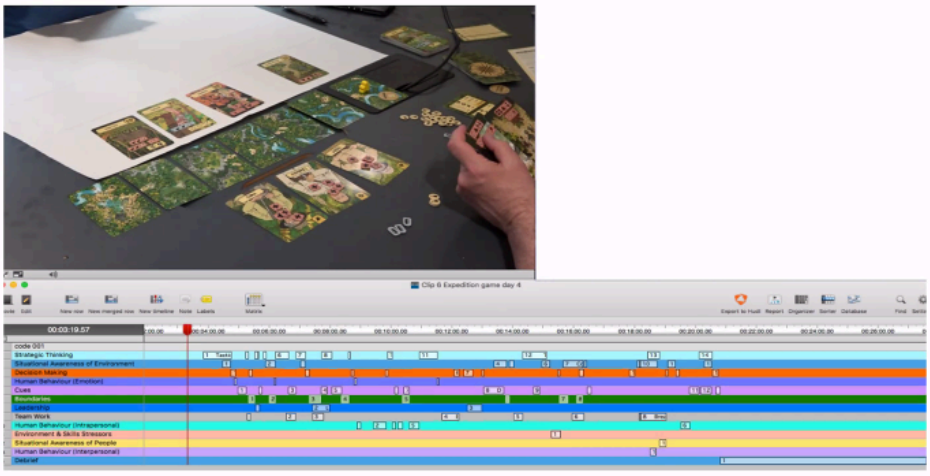


Figure 11 Real time coding bar

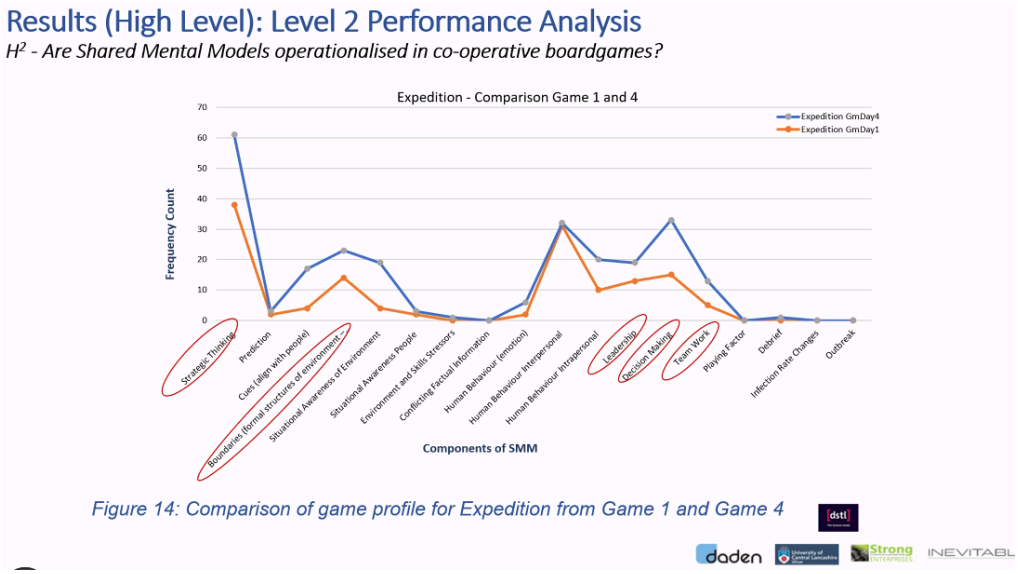


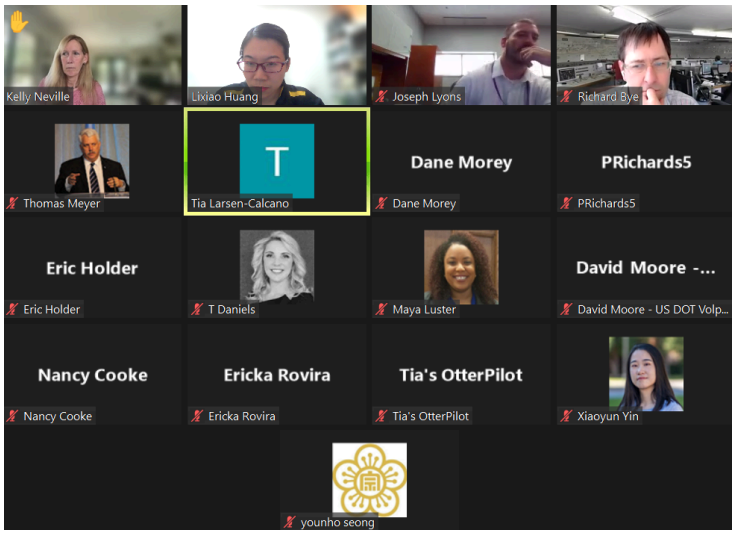
Figure 14: Comparison of game profile for Expedition from Game 1 and Game 4

Questions:

1. Challenges of collecting board games data
2. AI players to play Pandemic
3. How do you use eye tracking to study AI?

04/30/2024 Tia Larsen-Calcano

Attendees: Lixiao Huang, Maya Luster, Tressa, Kara, Nancy Cooke, Thom, Xiaoyun Yin, David Moore, Ericka Rovira, Kelly Neville, Joe Lyons, Erick Holder, Tia Larsen-Calcano



Agenda and minutes:

1. Topic: **Human Factors System Safety Requirement Development in Aviation AI Certification**
2. **Bio:** Tia Larsen-Calcano is a Safety Engineer at the U.S. Army Aviation and Missile Command. She specializes in Human Factors System Safety Engineering processes and requirements, and provided technical support and material release support on a variety of programs, notably Apache and FARA. Tia is an active member in standard development for advanced systems, including systems containing machine-learning, non-deterministic, or otherwise complex software. She is also pursuing a Ph.D. in Applied Experimental Psychology at the University of Alabama at Huntsville.

What is Human Factors System Safety

✓Leverage existing analyses to ensure that when pilots are expected to act on a failure, they:

- Understand the system enough to take the correct action in a timely manner
- Have the cognitive resources and physical ability to take an action
- Are presented with clear, prioritized information on the most critical actions
- Have the system capabilities available to them to take said action

✓How do we continue to have this assurance of safety with increasing automation and complexity to our systems?

What is Human Factors System Safety Engineering

✓System Safety Engineering is a specialty of Systems Engineering

✓System Safety applies engineering and management principles, criteria, and techniques to optimize safety within program constraints

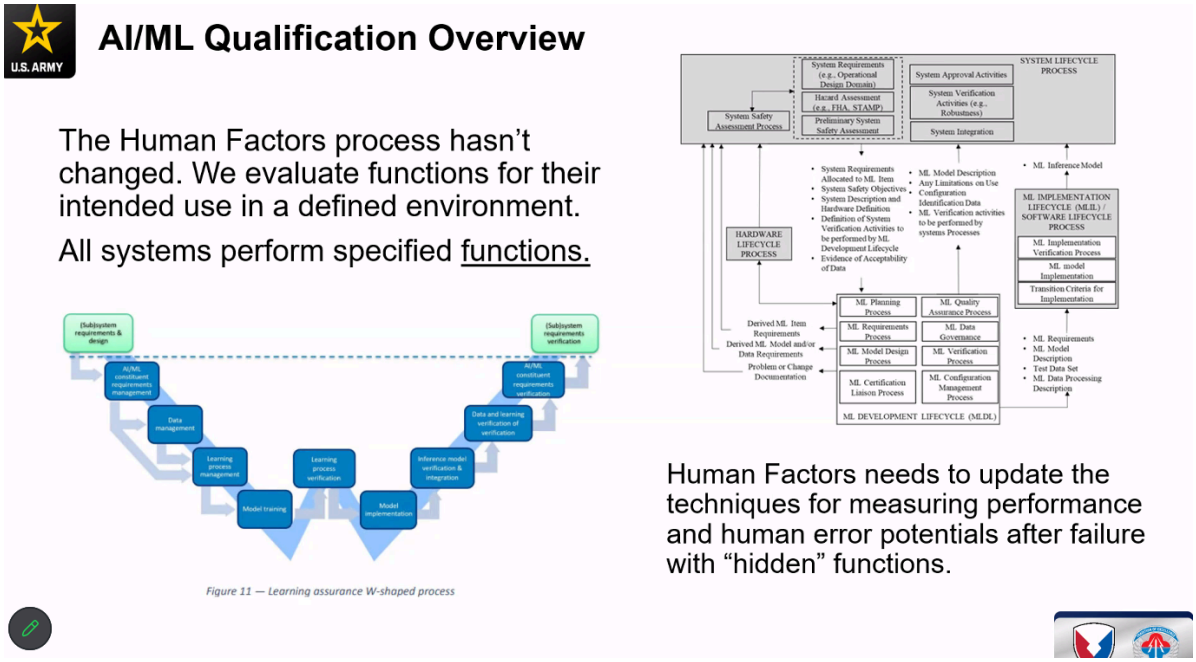
✓Techniques are often analytical and systematic

✓Processes are applied to MATERIEL SOLUTIONS and their designed intended use. System Safety predicts issues related to- and is fed back information on- operations once deployed (similar to the COTS process)

✓GOAL of System Safety is to eliminate or minimize risk to an acceptable level

✓Human Factors System Safety is the integrated of Human Factors Performance and Cognitive considerations into assessing how materials fail

3.



4. Occupational safety and material safety related issues
5. Machine learning:

- Defining what they need in human factors in the early process; in non-deterministic context,
- Understanding
- Different Software, training materials, different types of machine learning models, difference in coding versions,
- Main requirement of defining;
- Flight qualification;

Zoom Chat:

Tia's OtterPilot 9:05 AM

Hi, I'm an AI assistant helping Tia Larsen-Calcano take notes for this meeting. Follow along the transcript here: https://otter.ai/u/0cSxG-WoJjBCNf6-9wk0zX69cjM?utm_source=va_chat_link_1

You'll also be able to see screenshots of key moments, add highlights, comments, or action items to anything being said, and get an automatic summary after the meeting.

Richard Bye 9:15 AM

EASA work is here: Artificial Intelligence Roadmap - A human-centric approach to AI in aviation | EASA (europa.eu)

Thomas Meyer to Everyone 9:16 AM

How do you deal with degradation of situation awareness and startle effect when things begin to become non-nominal? Also, does your process treat AI as a flight partner or as a flight tool?

I know a few people in Human Factors society use ML methods. What are the challenging issues with these methods you can think of that may benefit from a focused group discussion?

Richard Bye 9:41 AM

Safety II professionals: How resilience engineering can transform safety practice - ScienceDirect

- Safety management approaches can be categorized as either a mode of centralized control or a mode of guided adaptability.

- Safety professionals and their organizations are focussed on a safety management mode of centralized control and this can be detrimental to safety.
- Resilience engineering, safety II and safety differently offer an alternative approach to safety management that resolve the shortcomings in traditional approaches to managing safety in complex systems.
- This paper provides the first practical description of the purpose, tasks and activities of a safety professional through the theoretical lens of resilience engineering and safety II.

Kelly Neville 9:46 AM

Hollnagel, E., Wears, R. L., & Braithwaite, J. (2015). From Safety-I to Safety-II: a white paper. *The resilient health care net: published simultaneously by the University of Southern Denmark, University of Florida, USA, and Macquarie University, Australia*.**https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9b336fce0f938b66ca2cab038650f35c1571779e**

3/26/2024 David Moore

Attendees: Lixiao Huang, Thomas, David, Silas, Eric, Phillart, Maya Luster

Zoom recording:

https://asu.zoom.us/rec/share/33Vo17B2ghjpGaDOAygCBuJ3KrQQhrH8Rm6ZKQMs5QATgB7M7qqaJHXpHj1oOyB2.XMXay3n1esTMf2qB

Passcode: l2y5KZ^&

Agenda:

1. Intro:

David Moore is co-chief of the U.S. DOT Volpe Center's Transportation Human Factors Division, within the Safety Management and Human Factors Technical Center. He has been at the U.S. DOT Volpe Center since 2009, working with scientists, analysts, policymakers, planners, and engineers conducting transportation safety research and managing safety programs.

Moore has served as the chief of the Transportation Human Factors Division since June of 2014. In this role, he co-leads a multi-disciplinary team of human factors researchers-with a focus on improving transportation safety across modes, especially in rail and transit. Moore served for five years as the executive agent of the U.S. DOT Human Factors Coordination Working Group, facilitating collaboration among human factors researchers across the Department and other federal agencies. He is a member of the National Academies of Science, Transportation Research Board (TRB) Standing Committee on Human Factors of Vehicles (ACH 30), a position held since 2016, and a member of the American Evaluation Association and Human Factors and Ergonomics Society.

From 2009 to 2014, Moore served as a management and program analyst coordinating the U.S. DOT Volpe Center's support of a federal regulatory agency's redesign of their enforcement prioritization and compliance assistance programs. From 2006 to 2009, he worked for Chenega Advanced Solutions and Engineering (CASE LLC), and from 1997 to 2006, for the management and technology consulting firm Booz Allen Hamilton-in both cases supporting U.S. federal government clients.

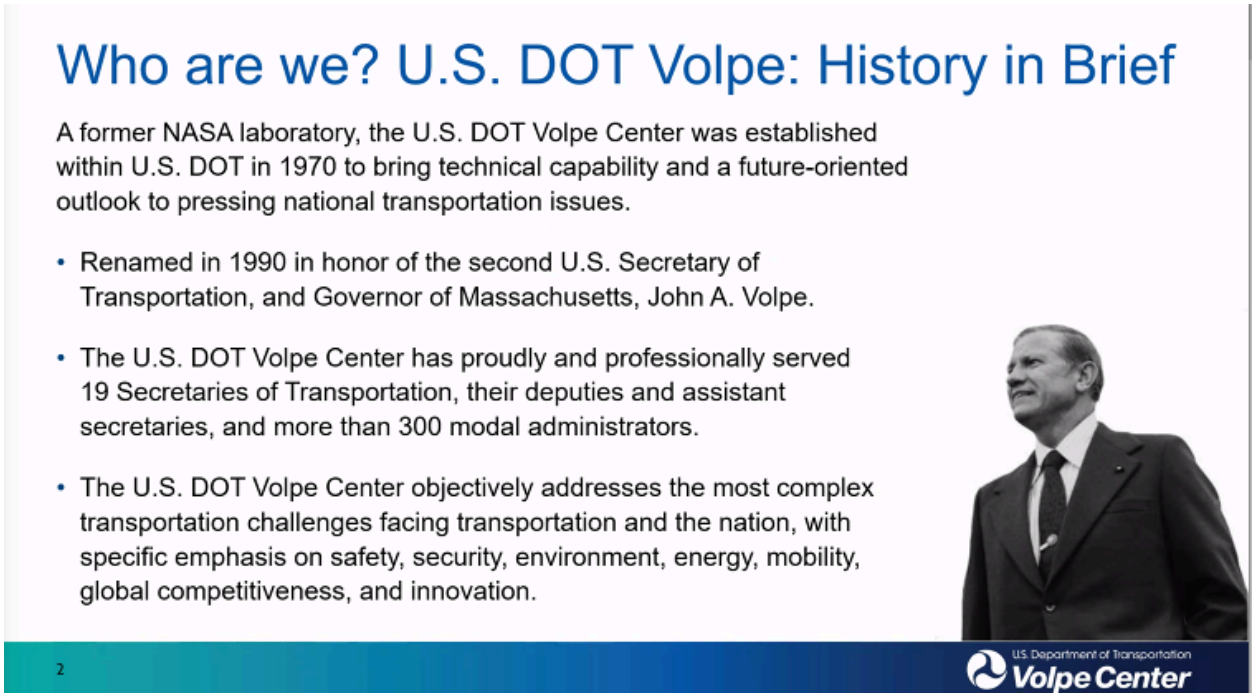
Moore received his BA in Political Science with a concentration in international relations from Colorado College (Colorado Springs, CO) and his MA in Urban and Environmental

Policy and Planning from Tufts University (Medford, MA). He pursues relevant topical certificate programs to stay current:

- Leadership Decision Making, Harvard Kennedy School (2022)
- Artificial Intelligence: Implications for Business Strategy (2018), MIT, and
- Geographic Information Systems, Graduate Certificate, Penn State (2006).

View David Moore's LinkedIn profile

Minutes:

1. David has a background more on policy-making background
2. 

3. 

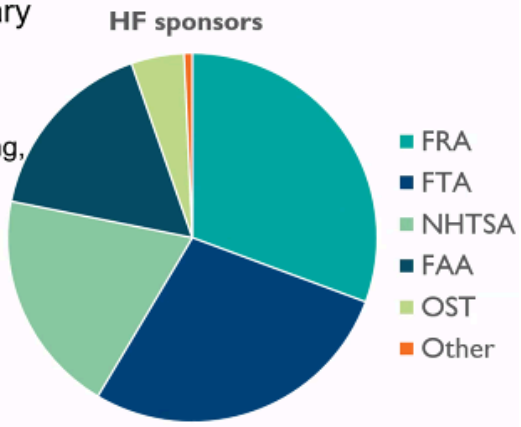
4. ## Our Mission

Improve the nation's transportation system by anticipating emerging issues and advancing technical, operational, and institutional innovations for the public good.

5.

Transportation Human Factors

- Transportation human factors is multi-disciplinary and multi-modal.
- It uses knowledge of:
  - Cognitive science, perception, information processing, computer science, engineering, and statistics to understand the relationships between humans and systems.
- "Systems" include:
  - Policies, people, processes, automation, various technologies, and their interaction.
- Goal is to improve transportation safety and efficiency through research, system design, and operations analysis.

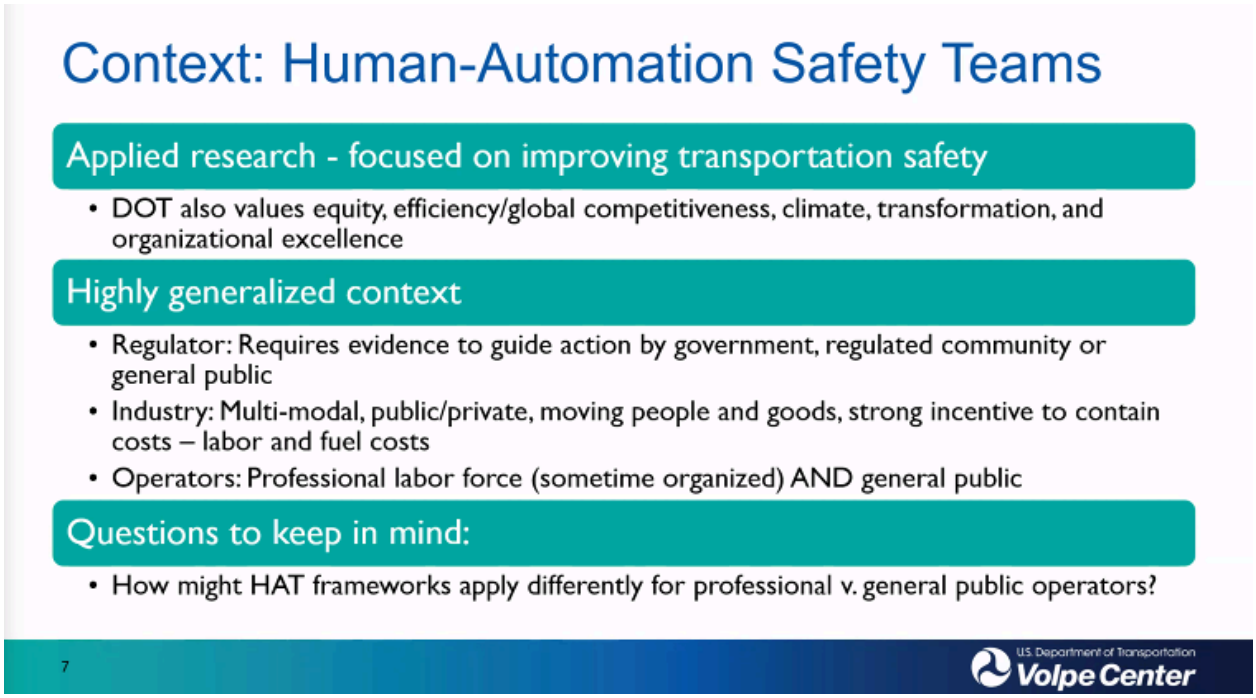


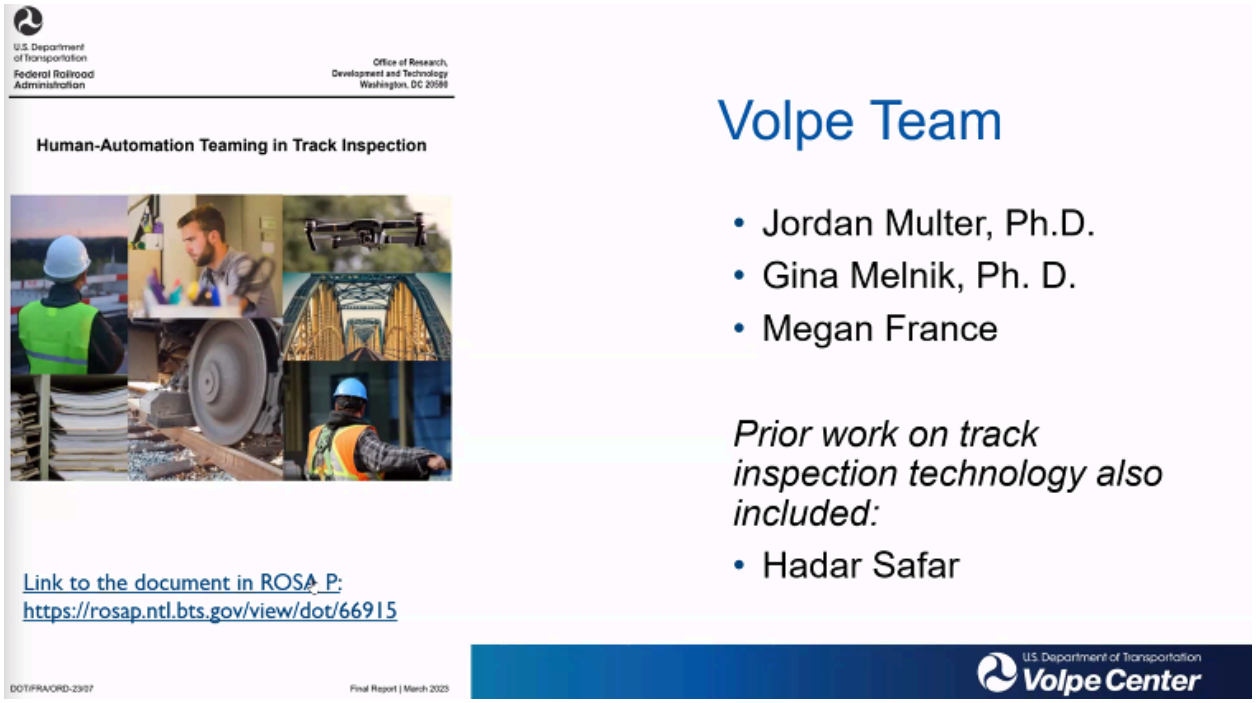
6. Methods:
   a. Observations
   b. Transit
   c. Multi-disciplinary

7.

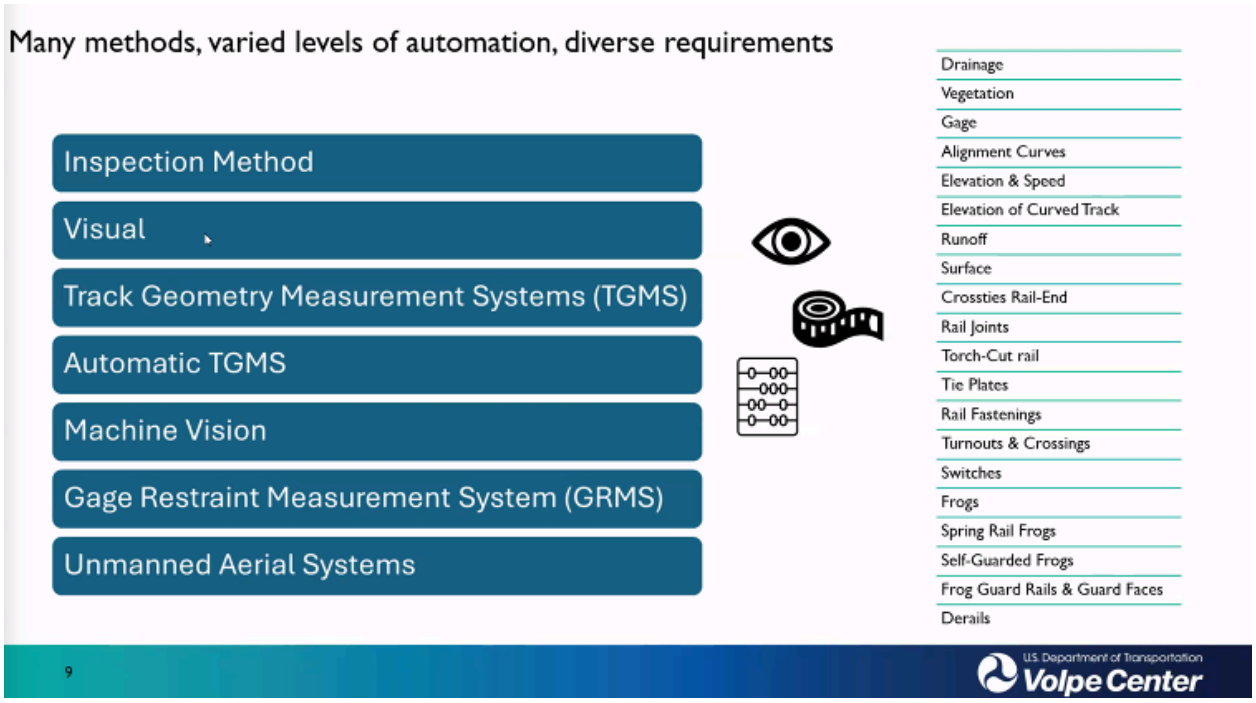
New Laboratory Space

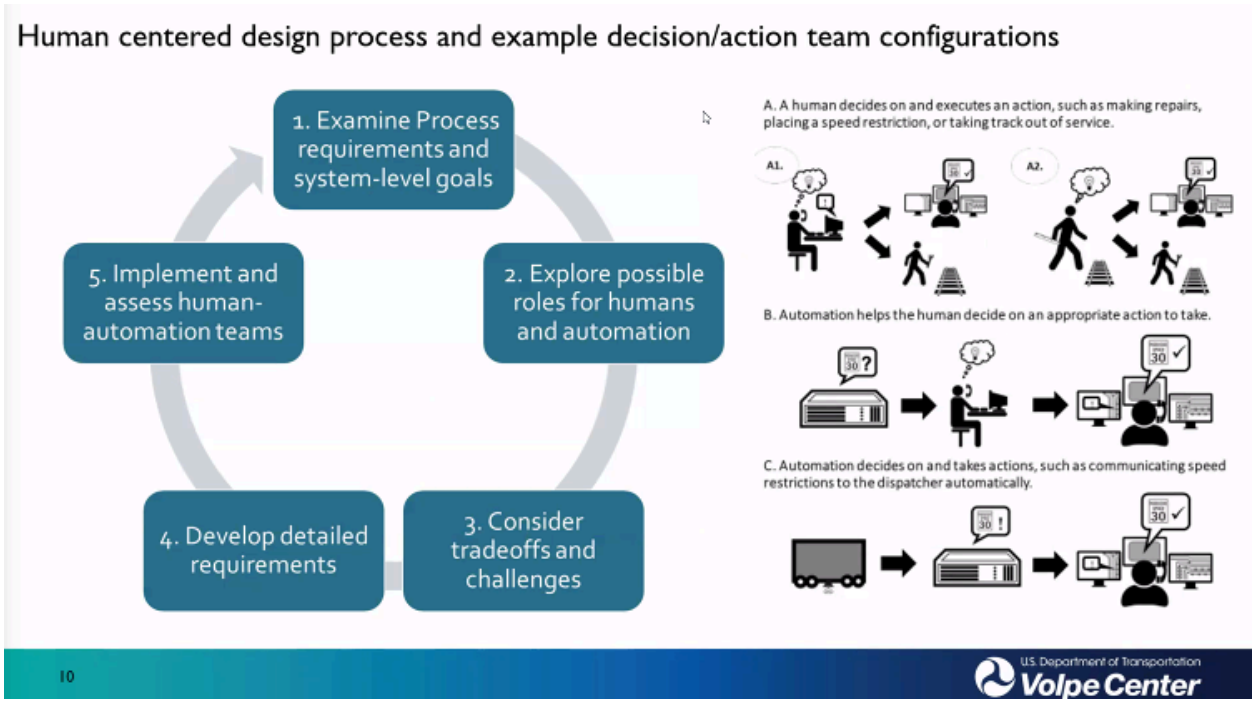
- Quiet User Interface Environmental Test (QUIET) Lab
- Human Factors Lab
  - FRA Grade Crossing and Locomotive Sim'
  - 737 Sim'
  - Augmented/Virtual Reality
- Maritime Situational Awareness Lab
- NextGen Lab
- Wake Vortex Lab
- NHTSA Alcohol Countermeasures Lab

8. 

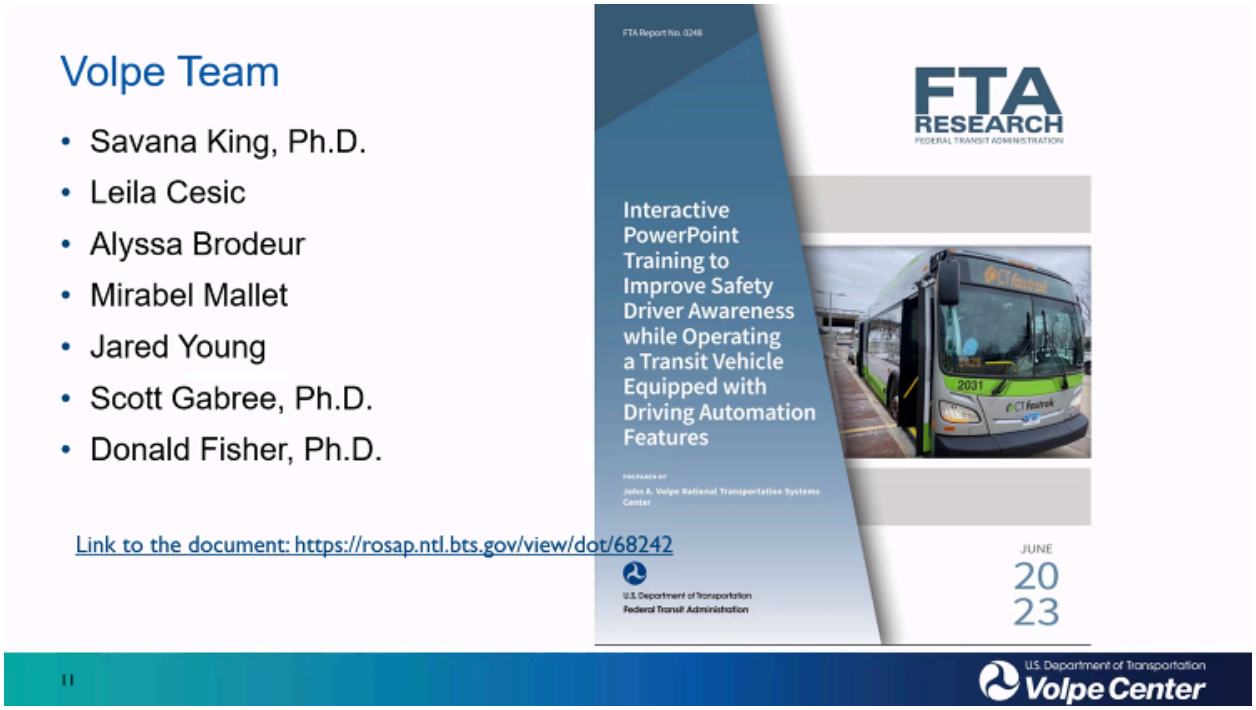
9. In the transportation industry, all the modes are multi-disciplinary;
    a. Question seeking feedback from the audience: How might HAT frameworks apply differently for professional vs. general public operators?
10. 

11. Gina Mlnik: program manager,

12. 

13. 

14. Hope: rail industry will look at this not rashing to put something in, careful with decision making;
15. Second example:

16. 

17. Goal: low-cost, safe, bus, ran independently outside human montoring,
    a. Bus sensing moving independently, the safety driver is there to do something about it,
    b. PowerPoint Training
        i. Hazard anticipation:
        ii. Hazard mitigation:
        iii. Attention Maintenance
18. The two examples used human-autonomy teaming:
19. Would like to have help with
    a. General public operators
    b. Our use of HAT

Question:

1. Silas 9:25 AM I missed it if you mentioned why you wanted/needed a secondary task in the research.
2. Silas made a comment:
3. Eric:
    a. Would bus drivers lose their job?
4. What was the hazard
5. Maya:

2/27/2024 Jill Drury

Attendees: Lixiao Huang, Jill Drury, Thomas Meyer, David Moore, Aminah, Zach, Eric HOlder, Sabina, Adam Fouse, Richard Bye, Maya Luster

Agenda:

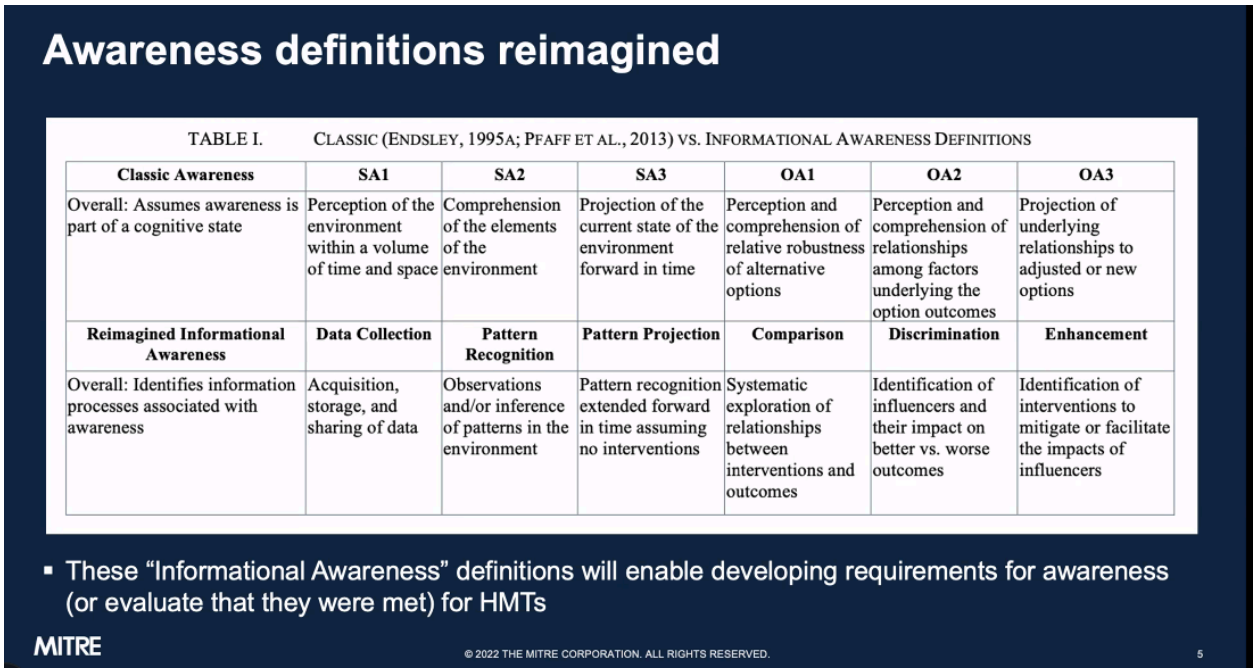
1. TG announcements
2. **Bio: Jill Drury** has a BA in Physics from Macalester College, a MSBA from Boston University Overseas Program, a MS degree in Computer Science from Boston University, a Graduate Certificate in Human-Computer Interaction from the University of Massachusetts Lowell, and a Sc.D in Computer Science from UMass Lowell. She is a department manager and researcher in collaboration systems, human-systems engineering, decision support, and human-machine teaming. She has published 100+ journal papers, conference papers, book

chapters, and magazine articles. Besides working at The MITRE Corporation since 1980, Drury has an adjunct role at UMass Lowell and was a visiting scientist at MIT for two years.

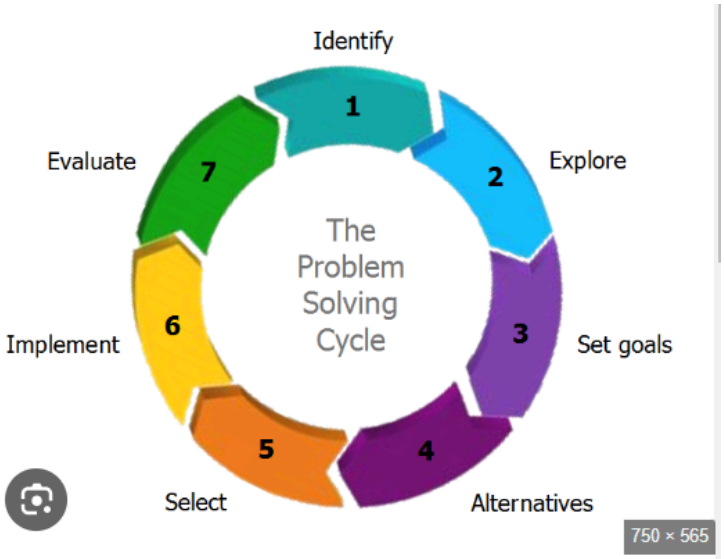
3. Talk and Q&A

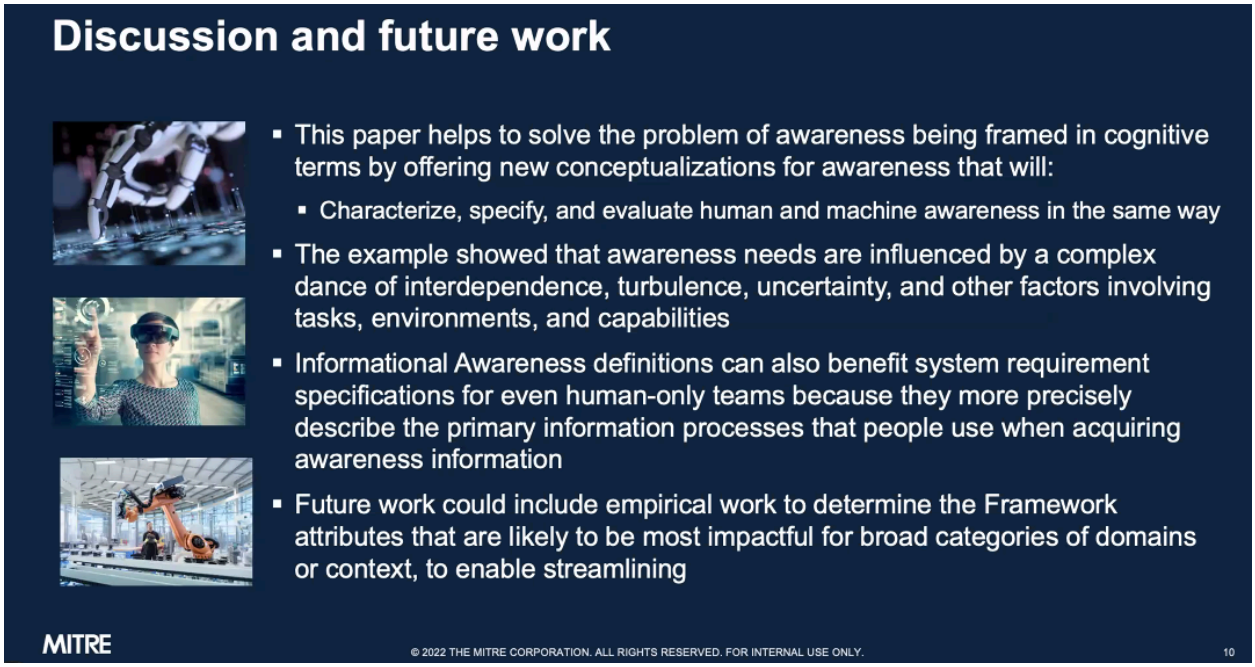
Minutes:

1. Q & A:
    a. How do we deal with the data? Any change of the methods?
2. The most important part of the talk:



3.





4. Q&A
    a. Adam: what are the process transitions from one state to another?
    b. Richard Bye 10:29 AM
    c. How does communication fit into the framing of informational awareness as a team construct?

1/30/2024 Nancy Cooke

Attendees:
Agenda:

Bio: Nancy J. Cooke is a professor in Human Systems Engineering at the Polytechnic School, one of the Ira A. Fulton Schools of Engineering at Arizona State University. She was the first director and is now Senior Scientific Advisor for Global Security Initiative's Center for Human, AI, and Robot Teaming (CHART). She received her PhD in Cognitive Psychology from New Mexico State University in 1987. Dr. Cooke is a Past President of the Human Factors and Ergonomics Society and the past chair of the Board on Human Systems Integration at the National Academies of Science, Engineering, and Medicine. She also chaired a study panel for the National Academies on Enhancing the Effectiveness of Team Science. Dr. Cooke was a member of the US Air Force Scientific Advisory Board from 2008-2012, and in 2014, she received the Human Factors and Ergonomics Society's Arnold M. Small President's Distinguished Service Award. Professor Cooke's research interests include the study of individual and team cognition and its application to the development of cognitive and knowledge

engineering methodologies, sensor operator threat detection, cyber and intelligence analysis, remotely-piloted aircraft systems, human-robot teaming, healthcare systems, and emergency response systems. More information about Nancy can be found on this website.

Agenda:
5-10 min: announcements
10-15 min: lightning talk
25-35 min: group discussions

Link to the slides today:
https://www.dropbox.com/scl/fi/zjkdsk3gssp4qdd8m4d7c/CHART-slides-01302024-HART.pptx?rlkey=60ho8t79mmnzzcor23e308bgy&dl=0

Talk recording:

https://asu.zoom.us/rec/share/KqqqZAmdurKX0OqrLFg5cfoNG3stuDdvqOIVxu3I2-x3Sfkf9Jot2ML2Flu_wkZW.-V0aG4g8gb4qclqQ
Passcode: bw9R?Ojm