

2022 HART TG Member Conversations

Rolling Agenda and Meeting Minutes

Zoom Link:

Join from PC, Mac, Linux, iOS or Android:

<https://asu.zoom.us/j/89773957868?pwd=anJkVkJpVWlVZk5saHFmY3FyUXNWQT09>

Password: hart

Meeting ID: 897 7395 7868

Typical Meeting Agenda:

1. TG announcements (~5 min):
2. Lightning talk, and Q&A (~10+15 min);
3. Small group discussions: about 2-3 people a group (20~30 min)

Event Calendar 2022: Last Tue each month at 12 pm ET

Dates	Topics	Speaker
Jan 25, 2022	Responding to the NAS Report on the State of the Art and Research Needs of Human-AI-Robot Teaming	Mica Endsley
Feb 22, 2022	Analyzing Streams of Language	Cheryl Geisler
Mar 29, 2022	No lightning talk only small groups	
Apr 26, 2022	Measuring Real-time Coordination Dynamics: Extensible Models and Metrics for Human-AI-Robot Teaming	Jamie Gorman
May 31, 2022	STEAHM-based Autonomy Convergence Research	Nhut Ho
Jun 28, 2022	Unobtrusively estimating operator cognitive states in real-time to enable adaptive autonomous systems	Torin K Clark
Jul 26, 2022	A recently finished DARPA project on Explainable AI	James Niehaus
Aug 30, 2022	Human-Robot Collaboration	Chien-Ming Huang

Sep 27, 2022	Cybernetic Training for Autonomous Robots: Generalizable Autonomy in Robot Manipulation towards Human Augmentation	Denis Garagic
Oct 10-14, 2022	In-person HFES Annual Conference Business meeting in Atlanta Our HART TG business meeting will be held on Tuesday, Oct 11th , from 5:15 pm to 6 pm in room A602 at the conference hotel. This is followed by our HART TG social event from 6:30 pm to 8:30 pm at Views Bar and Grill Atlanta , 200 Peachtree St NE, Atlanta, GA 30303 (6 min walking from the conference hotel)	
November 2022	Canceled	
December 2022	Canceled	

[HART TG Member Conversations 2021](#) (Archived)

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9/27/2022 Dr. Denis Garagic

Attendees: Lixiao Huang, Denis Garagich, Katie Guest, Jessie A. Jim McCarthy, Dane Morey, Satyajit, Joseph Lyons, Denial Graff, Phillart, Myke Cohen, Wenbin Guo, Maddie McCarty, Nancy Cooke, Kelly Neville, Dave Miller, Kathy, Sherry Chappell (18 people)

Agenda:

1. ~10 min lightning talk
2. ~20 min Q&A
3. ~30 min small group networking

Minutes:

1. HART TG annual meeting and social event: Our **HART TG business meeting** will be held on **Tuesday, Oct 11th**, from **5:15 pm to 6 pm** in room **A602** at the conference hotel. This is followed by our **HART TG social event** from **6:30 pm to 8:30 pm** at [Views Bar and Grill Atlanta](#), 200 Peachtree St NE, Atlanta, GA 30303 (6 min walking from the conference hotel).
2. Denis bio: Dr. Denis Garagić serves as Chief Technology Officer for Sarcos Technology and Robotics Corporation. In this role, Dr. Garagić is responsible for technical guidance across all innovation, engineering, and technology teams. Dr. Garagić also oversees Sarcos' overall technology development and utilization plans and plays an integral role in helping to develop the company's strategic direction, development, and future growth. Dr. Garagić has more than 25 years of experience in AI and machine learning technology.
 - a. Prior to becoming CTO, Dr. Garagić served as the Chief Scientist at Sarcos and was responsible for advancing the Sarcos artificial intelligence (AI) program by developing and implementing innovative control strategies, intelligent algorithms, and machine learning (ML) in future generations of Sarcos innovative robotics solutions.
 - b. Prior to joining Sarcos, he served as Chief Scientist at BAE Systems FAST Labs, guiding the creation of cognitive computing solutions that provided machine intelligence and anticipatory intelligence to solve challenges across the Department of Defense and intelligence community.
 - c. He has been a Technical Review Authority, Principal Investigator, or Research Lead on numerous programs, including DARPA and Air Force Research Labs (AFRL) research programs. Dr. Garagić is also a regular speaker at international meetings and conferences on AI & ML, influencing the way these technologies are transforming the defense, intelligence, and security industries.
 - d. Dr. Garagić has written more than 40 journals, articles, and conference papers and holds several patents in applied controls for autonomous robotics and machine learning. He received his B.S. and M.S. degrees in Mechanical Engineering and Technical Cybernetics from The Czech Technical University in

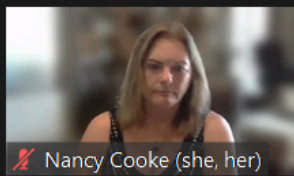
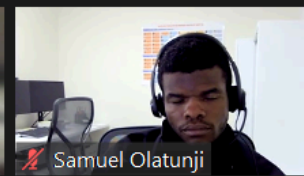
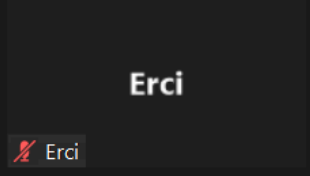
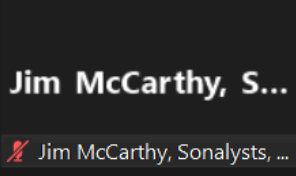
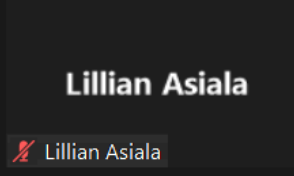
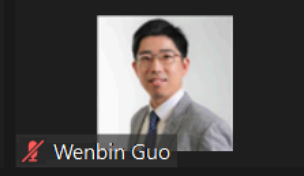
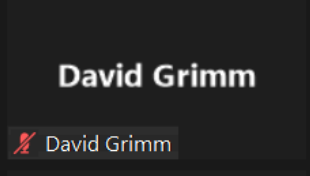
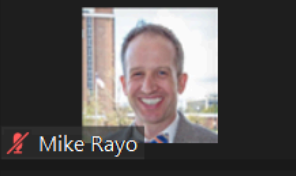
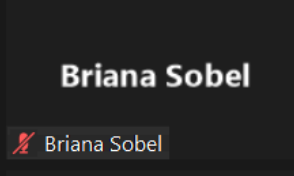
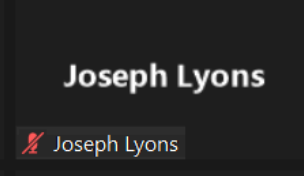
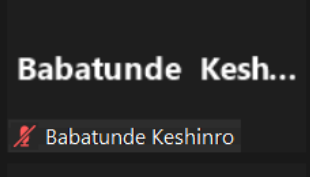
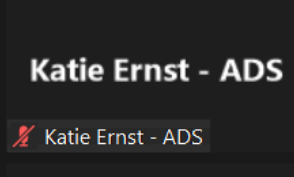
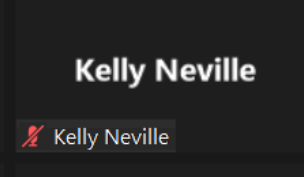
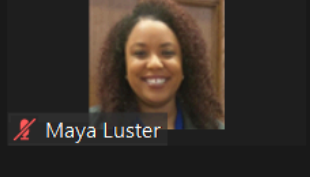
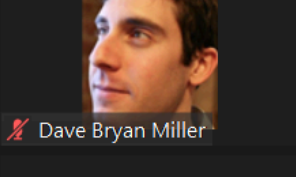
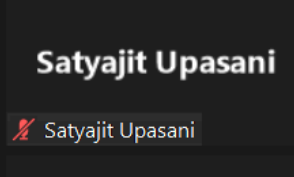
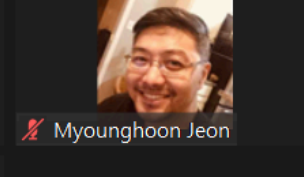
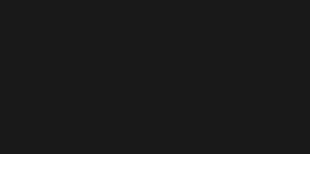
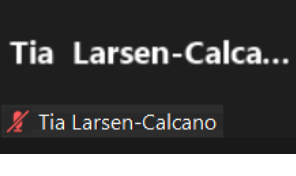
Prague and received his Ph.D. in Mechanical Engineering from The Ohio State University.

3. The talk of demonstrating Human-robot teaming improves dexterity and task handling.
 - a. **Cybernetic Training for Autonomous Robots: Generalizable Autonomy in Robot Manipulation towards Human Augmentation** Human-worn exoskeleton robots such as the Guardian® XO® exoskeleton and dexterous manipulation-capable mobile platforms such as the Guardian® XT® system have extensive potential benefits to the commercial, industrial, and defense sectors. The wide variety of potential applications of these platforms include: (i) commercial and residential construction; (ii) logistics; (iii) transportation; (iv) energy production; (iv) inspection; (v) manufacturing in the automotive, aerospace, and heavy industries; and (vi) repair and maintenance, to list just a few.
 - b. The benefits of dexterous mobile robots can be multiplied by allowing such systems to learn from their operators how to execute tasks and then be able to conduct those tasks on their own in a weakly structured environment. This approach is the province of a platform that we refer to as “CYTAR™” – short for Cybernetic Training for Autonomous Robots.
 - c. Existing robots perform poorly in dynamic and unstructured environments. Traditional machine learning (ML) requires a time-consuming and expensive trial-and-error approach. Existing AI/ML solutions are environment-specific and hard to replicate as conditions change. As a result, many industries cannot benefit from the efficiencies offered by technological advancements. Sarcos’ Cybernetic Training for Autonomous Robots (CYTAR™) technology program is focused on bringing autonomy to unstructured workplaces.
 - d. The CYTAR™ platform is being developed to build on emerging Machine Learning/Artificial Intelligence (ML/AI)-powered robotics technologies to enable repair and maintenance, logistics support and, in the long run, the industrial environment of the future where hundreds of networked exoskeleton (XO® robots)-equipped operators and CYTAR™ humanoid robots work as a team to achieve increased productivity and prevent worker injuries.
 - e. The talk will provide an overview of robotic systems that combine human intelligence, instincts and judgment with the strength, endurance and precision of machines to (i) augment human performance and awareness and (ii) operate autonomously when trained or remotely controlled by a human operator in unstructured environments.
4. Q & A:
 - a. How much the robots can sense the humans?
 - b. Lessons learned from shared control?
 - i. They are heavily model based; you do not large quantity from one subject, but how can we use data from multiple subjects. .. uses a combin bottom up and top-down approaches.
 - c. The time of training and amount of training ?
 - i. There is much about reinforcement learning. If you do not capture the rewards, the training becomes cumbersome. Learn the objective function

based on the data. Learn muscle interpret the motion. Do it on a probabilistic set.

8/30/2022 Dr. Chien-Ming Huang

Attendees (please add your name if not yet): Maya Luster, Nancy Cooke, Lixiao Huang, Chien-Ming Huang, Samuel Olatunji, Eric, Jim McCarthy, Lillian Asiala, David Grimm, Mike Rayo, Brianna Sobel, Joseph Lyons, Babatunde Keshinro, Mohamed Sheik-Nainr, Weibin Guo, David Grimm, Katie Ernst-ADS, Wei Xu, Dave Bryan Miller, Satyajit Upasani, Myonghoon Jeon, Tia Larsen-Calcano (22 people)

 Chien-Ming Huang	 Lixiao HUANG	 Nancy Cooke (she, her)	 Samuel Olatunji
 Erci	 Jim McCarthy, Sonalysts, ...	 Lillian Asiala	 Wenbin Guo
 David Grimm	 Mike Rayo	 Briana Sobel	 Joseph Lyons
 Babatunde Keshinro	 Mohamed Sheik-Nainar	 Katie Ernst - ADS	 Kelly Neville
 Maya Luster	 Dave Bryan Miller	 Satyajit Upasani	 Myounghoon Jeon
 Tia Larsen-Calcano	 Wei Xu		

Agenda:

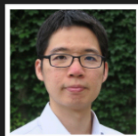
4. ~10 min lightning talk
5. ~20 min Q&A
6. ~30 min small group networking

Minutes:

1. **Chien-Ming Huang** is the John C. Malone Assistant Professor in the Department of Computer Science at the Johns Hopkins University. His research focuses on human-AI teaming and seeks to enable interactive AI technologies capable of providing physical, social, and cognitive support to people with a variety of abilities. He has published in top-tier venues in HRI, HCI, and robotics, including Science Robotics, HRI, CHI, and CSCW. His research has received media coverage from MIT Technology Review, Tech Insider, and Science Nation. Huang completed his postdoctoral research at Yale University and received his Ph.D. in Computer Science at the University of Wisconsin–Madison. Dr. Huang is a recent recipient of the NSF CAREER award. More information can be found in his website:

www.cs.jhu.edu/~cmhuang

MODELING HUMAN BEHAVIOR TO ENHANCE HUMAN-AI TEAMING



Chien-Ming Huang, PhD

John C. Malone Assistant Professor
Department of Computer Science
Malone Center for Engineering in Healthcare

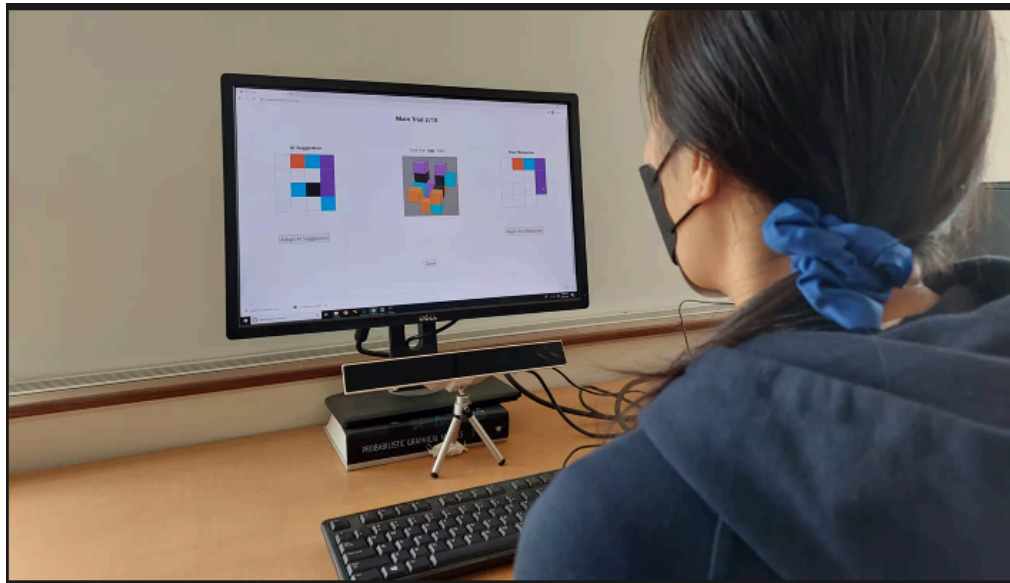
intuitivecomputing.jhu.edu | Intuitive Computing Laboratory
Johns Hopkins University

2. Part 1:
 - a. People react socially with human errors.
 - b. A diversity of social responses.

- c. Progressive social signals:



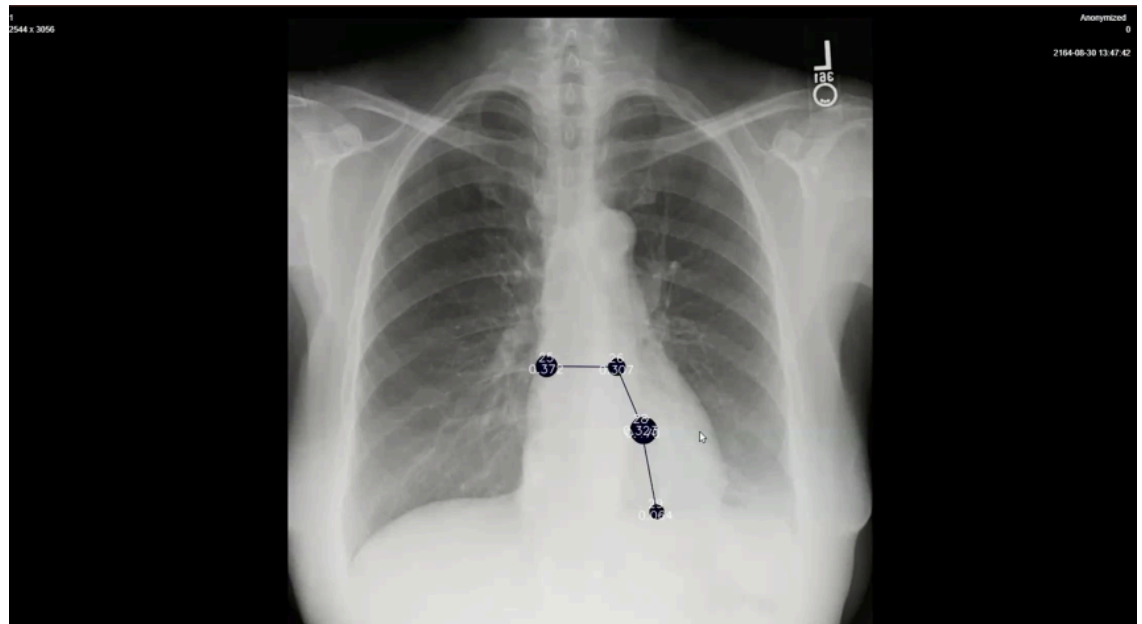
- d. Facilitate error diagnosis
- e. Provide timely error mitigation
3. Part 2: cognitive teaming in AI-assisted decision making
- a. Gaze-based understanding of user reliance on AI
- b. Toward real-time trust calibration: not retrospective;



c.



- d. People use AI suggestion to complete the task
- e. Gaze as indicative signals for reliance
- f. Realistic example/application in clinic:



- g. Other applications in Education in identifying the young talented
- h. **Contact information is on Chien-Ming Huang's website:**
<https://www.cs.jhu.edu/~cmhuang/>

Q&A:

1. Whether AI is considered teammate?
 - a. Whether teammate or supervisor, AI is giving suggestions.
2. What is the name of the spatial rotation task used in the study?
 - a. Perspective taking
 - b. Other people have used paper folding tasks
3. How did you calibrate the gaze in reliance? Suggestion presentation.

4. What is the goal of viewing the x-ray images?

7/26/2022 Dr. James Niehaus

Attendees (please add your name if not yet): Eric Holder, Lixiao Huang, Nancy Cooke, Dave Miller, Lamar Harrell, James Niehaus, Myke Cohen, Dav Wollman, Emily Patterson, Joe Manganelli, Laura Smith-Velazquez

Agenda:

1. ~10 min lightning talk
2. ~20 min Q&A
3. ~30 min small group networking

Minutes:

1. **James Niehaus bio:** **Dr. James Niehaus** is a Principal Scientist at Charles River Analytics. Dr. Niehaus specializes in the computational modeling of narrative. As the principal investigator for multiple efforts to develop new training technologies, Niehaus has developed game-based training and virtual coaches for a wide range of audiences; investigated the neural, cognitive, and behavioral relationship between implicit learning and intuition; and worked on social robots for Alzheimer's patients. With more than 15 years' experience applying AI to training systems and instructional design, Niehaus is a highly valued mentor and collaborator for other Charles River scientists and engineers, contributing to a variety of virtual and adaptive systems for medical training. He's also worked on narrative generation projects, cultural interaction with virtual agents, and cognitive models of discourse comprehension. Niehaus has a B.S. in computer science from the College of Charleston and a Ph.D. in computer science from North Carolina State University. He is a member of the Society for Simulation in Healthcare and of the National Training and Simulation Association. His extensive publications list includes ["Designing Serious Games to Train Medical Team Skills"](#) (with Ashley McDermott and Peter Weyhrauch), "Applications of Virtual Environments in Human Factors Research and Practice" (co-author), and ["Development of Virtual Simulations for Medical Team Training: An Evaluation of Key Features"](#) (with Ashley McDermott, Peter Weyhrauch, et al.)
2. CAMEL's XAI: A DARPA sponsored project;
3. Deep RL produced Alien Intelligence
4. Learning causal models to generate Explanations
5. Questions:
 - a. What is the definition of narrative? Is it verbal communication? Is it the explanation?
 - b. What is the goal of the game and rules of the game?
 - c. Is the Startcraft2 a off-the-shelf game or house developed game?
 - d. When is the explanation provided? Via text or voice?
 - e. How the experiment motivate people to perform well in the study?

- f. Regarding "IMPROVED their mental models", does this mean that the agent and the user had an improved shared model (team alignment yields a benefit) OR that the user gained an improved understanding of the world beyond the team (external validity of mental model is improved and yields a benefit), OR both clauses are true, OR neither clause is true?
- g. Was there a correlation between the stated confidence of the AI and the user's performance? on the probability that a user trust the explanation of the AI?

CAMEL Explanation User Interface (XUI)



6.

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Proprietary

UMassAmherst



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Evaluation Hypotheses

3. Richer mental model of an AI system as measured by a survey on how the agent works and by performance in the joint task

- Supported:
 - Participants **IMPROVED their mental models** after explanations by our scoring system ($p=1e-12$, Out of 100: PreX Mean: 15.0, Std dev: 8.34, PostX Mean: 67.0, Std dev: 28.57)
 - Participants **IMPROVED their mental model of the agent poisoning** by conditions mentioned ($p=1e-20$, PreX Mean: 0.08, Std dev: 0.26, PostX Mean: 1.35, Std dev: 0.79)
 - No difference** in the participants' recognition of the non-explained elements of the agent ($p=0.496$)
 - No difference** in the overall mental models of Agent A and Agent B ($p=0.844$)
 - Participants **IMPROVED their understanding of how to use the agent** with respect to the poisoning conditions with explanations ($p=0.0002$ PreX Mean: 0.2, Std dev: 0.37, PreX Mean: 0.42, Std dev: 0.47)
 - No difference** in the participants understanding of using the agent on the weakest enemies ($p=0.903$)
 - Participants rated the agent **MORE predictable** ($p=0.016$) and themselves **BETTER able to judge when to use and not use** ($p=0.001$) after explanations.
 - No difference** in the participants' ratings of confidence in the agent, that the agent was better than a novice, nor that they could count on it more after explanations.

7.

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6/28/2022

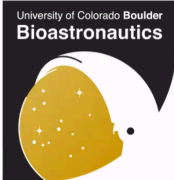
Attendees: Lixiao Huang, Jessie A, Myke Cohen, Eric Holder, Kathy Hayna, David Grimm, Joseph Hought, Torin Clark,

Agenda:

8. ~10 min lightning talk
9. ~20 min Q&A
10. ~30 min small group networking

Meeting minutes:

1. A short bio of Dr. Clark: **Dr. Torin K. Clark** is an Assistant Professor in the Smead Aerospace Engineering Sciences department and Biomedical Engineering program at CU-Boulder. His research group is part of the Bioastronautics Laboratory and he is a faculty affiliate of BioServe Space Technologies. His research is focused on the challenges that humans face during space exploration missions and in other extreme environments, such as pilots of high performance aircraft. Specifically he focuses on astronaut biomedical issues, space human factors, human sensorimotor/vestibular function and adaptation, interaction of human-autonomous and human-robotic systems, mathematical models of spatial orientation perception, and human-in-the-loop experiments.
2. Talk points:



Unobtrusively Estimating Operator Cognitive States in Real-Time to Enable Adaptive Autonomous Systems

Torin K. Clark, Jacob R. Kintz, Savannah L. Buchner, and
Allison P. Anderson
Smead Aerospace Engineering Sciences
University of Colorado Boulder

torin.clark@colorado.edu

This work was supported by a Space Technology Research Institutes
grant from NASA's Space Technology Research Grants Program

Motivation and Background

- Future human-autonomy teams should intelligently adjust their behavior based upon teammate cognitive states (Schwarz & Fuchs, 2018; Parasuraman et al., 2008)
 - Adaptive autonomy: human's workload become too high → *autonomous teammate realizes this* → autonomous system performs a larger portion of the tasks
 - Requires autonomous system to infer human cognitive states, *unobtrusively*
- Prior research (Bruder & Schwarz, 2019; Heard et al., 2020; Heard & Adams, 2019; Schwarz & Fuchs, 2018) mostly limited to inferring
 - A single cognitive state
 - Easily observable factors (e.g., taskload)
 - Descriptive estimates

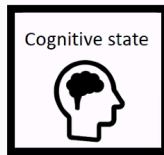
Embedded measures

Experimental Summary

- Can unobtrusive measures infer?:
 - Trust
 - Workload
 - Situation Awareness
- Explore autonomous mode's effect on TWSA:
 1. Operator selects one of 3 actions
 2. Operator accepts/rejects action
 3. Operator accepts/rejects action, reasoning explained by system
 4. Action taken unless operator vetoes within 30s
 5. Action taken unless operator vetoes within 30s, reasoning explained by system



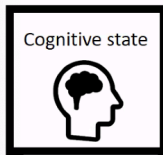
Inference Model Fitting



Trust in Automated Systems
Modified Bedford workload
10D SART

Current “gold-standard”
(not practical for operations)

1)



This experiment: embedded
measures, physiological
measures, and other
observable information
validation

2)

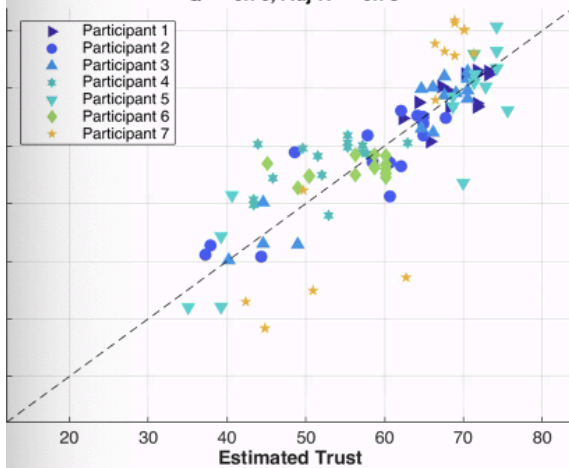


HART TG Monthly Member Conversation Lightning Talk



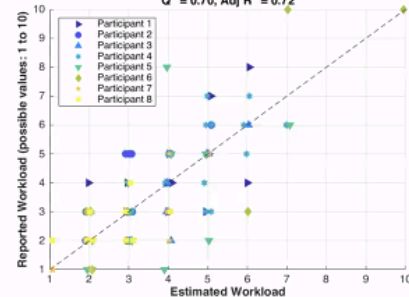
Preliminary Results: Trust

Reported Trust vs. Estimated Trust
participant predicted using data from other 6 (Participant 8 excluded)
 $Q^2 = 0.70$, Adj $R^2 = 0.78$



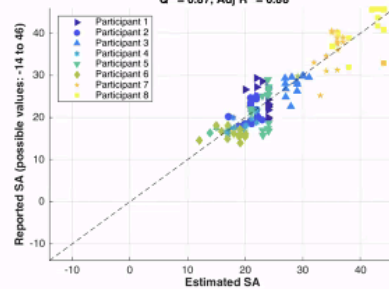
Reported Workload vs. Estimated Workload
Leave-one-out cross validation

$Q^2 = 0.70$, Adj $R^2 = 0.72$



Reported SA vs. Estimated SA
Leave-one-out cross validation

$Q^2 = 0.87$, Adj $R^2 = 0.88$



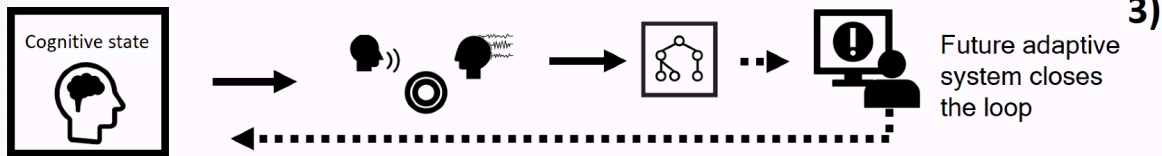
6/28/2022

HART TG Monthly Member Conversation Lightning Talk



Preliminary results on Trust: $R^2=0.78$ between reported trust and estimated trust.

Next Steps and Outstanding Questions



- Explore adaptation strategies and types of unobtrusive information (e.g., individual info, personalized predictive models)
- How can we best incorporate our unobtrusive measurements into a real-time adaptive system?
- How can we capture and utilize the uncertainty in our estimates of trust, workload, SA?



6/28/2022

HART TG Monthly Member Conversation Lightning Talk



Q & A;

1. For the autonomous systems to be adaptive, it is best for humans to do what is their strength; hard to identify what humans are good at, if we can identify that, why are they not doing them already? - highly dynamic scenarios, identify the workload,
2. Building models are based on the psychological, are there any behavioral?
 - a. Have a suit of psychophysical sensors, fNIRs, EEG, behavioral measure: types of actions, inactions, and timing of actions. The models showed today are not using the behavioral data yet.
3. Are the tasks context specific? This is related to personalization and generalization.
 - a. We can leave some data out to make the model fit for individuals...[more points not fast enough to catch.]
 - b. Use intelligent judge the person might judge; how generalizable not sure but you can use the method to cover a range of the topics.
4. More details about the model?
 - a. One
 - b. Linear regression: each trial is for some outcome;
 - c. Models can incorporate surveys
5. Feature selection is not part of the classification.
- 6.

5/31/2022

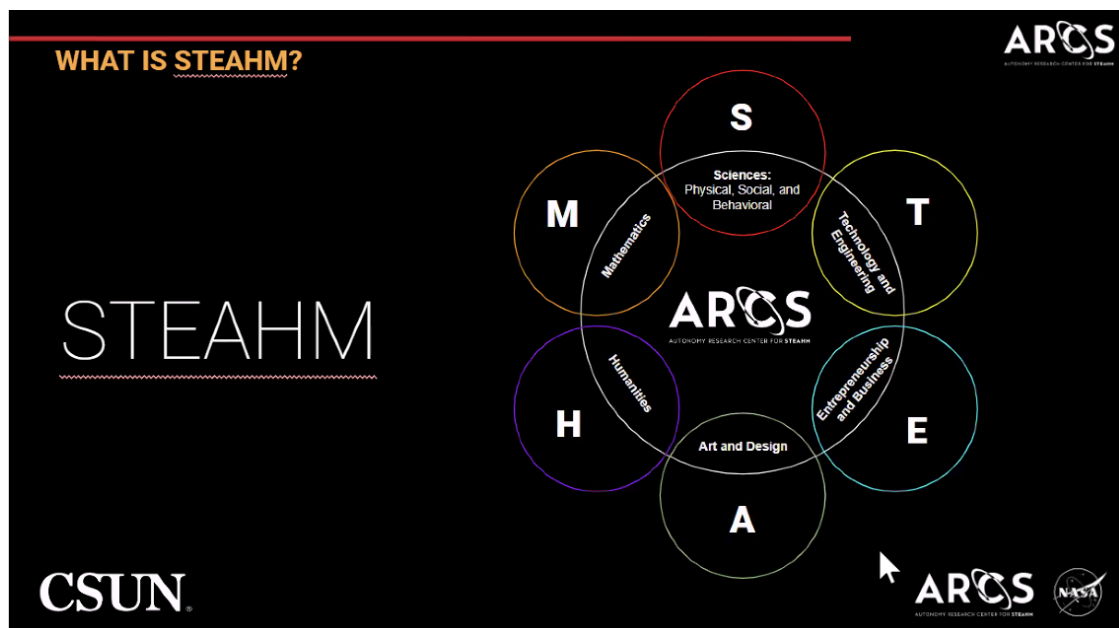
Attendees: Lixiao Huang, Eric Holder, Nancy Cooke, Dr. Nhut Ho, Dave Miller, Joseph Lyons, Sherry Chappell, J. Manganelli, Shiwen Zhou, Coleen Donovan, Jayde King, a total of 13 people.

Agenda:

1. ~10 min lightning talk
2. ~20 min Q&A
3. ~30 min small group networking

Minutes:

1. Research requires multidisciplinary effort
2. MIT hired a female biologist (not an engineer) to lead an institute for the first time. That was the beginning to involve more minorities.
3. The STEAHM involves six aspects as shown below:



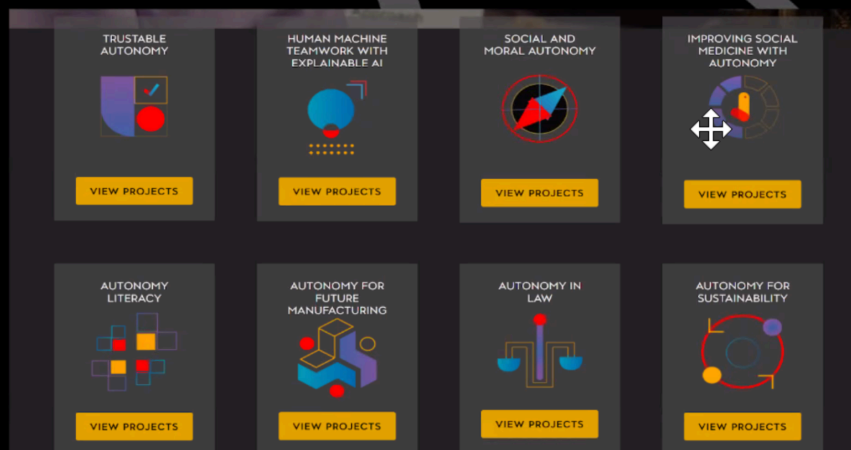
ARCS Vision and Mission

- International leader in research, education, and commercialization of Increasingly Autonomous (IA) systems
- University-wide, multidisciplinary, financially self-sustaining COE
- Change agent and leadership role in building a culture of **Convergence Research** (i.e., deep integration across multiple disciplines) as a high-impact educational activity for underserved and underrepresented students
- Collaboration with NASA, industry, and government in autonomy research
 - Increasing institutional research capacity
 - Developing workforce in STEM and NASA-related fields, and
 - Transitioning research results to address pressing societal needs.

CSUN

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Research Areas



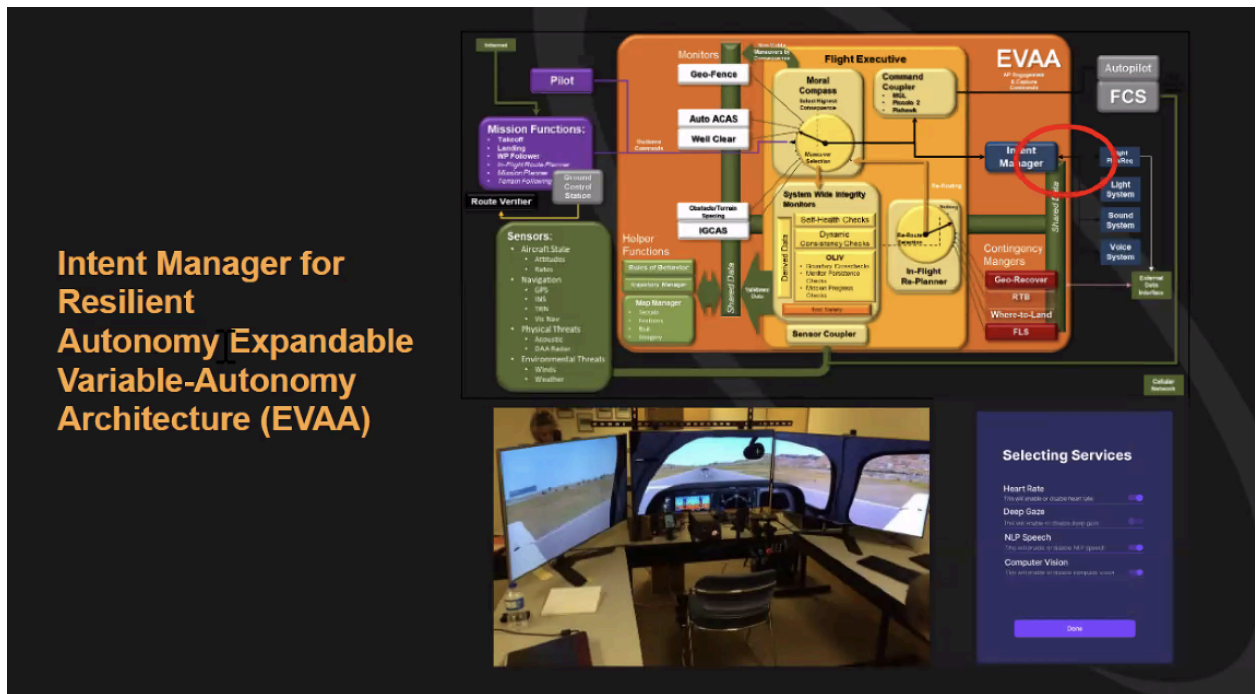
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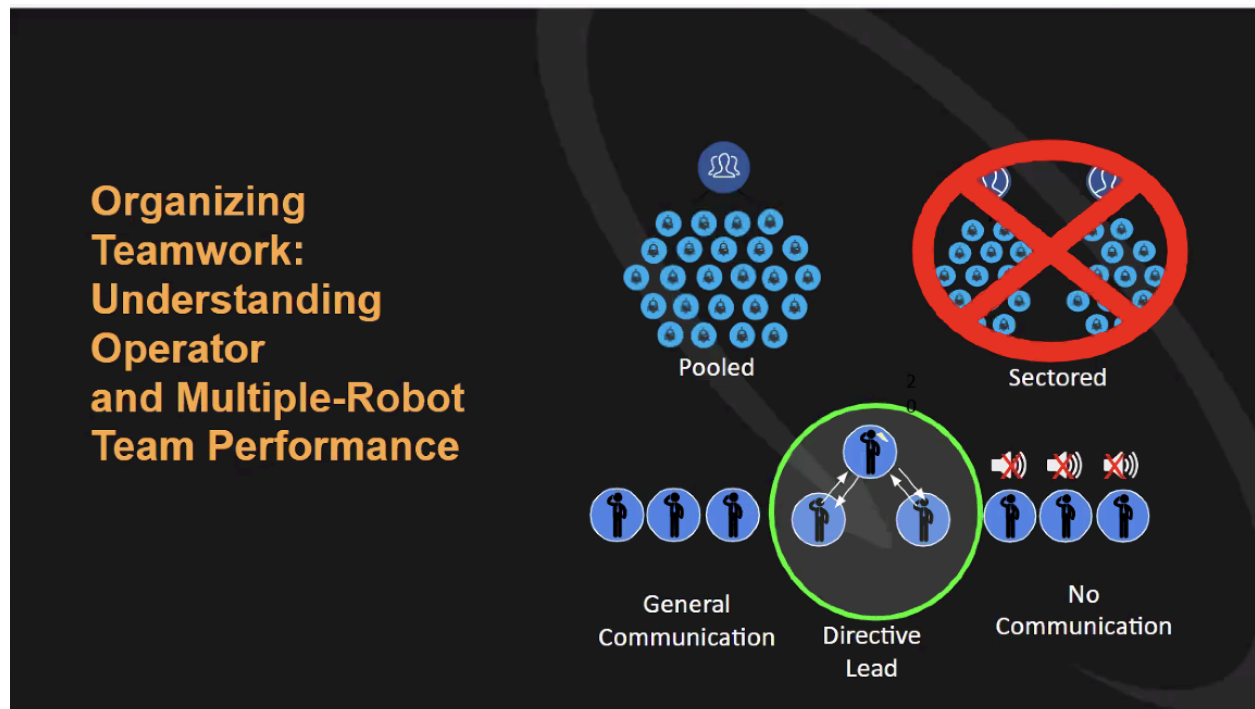
There are a number of projects in the program, including but not limited to the following:

- Trustable Autonomy with NASA JPL
- Project on robot help with fire fighting
- Project on robot giving tours;
- Human Machine Teaming on Explainable AI;
- Examining operational Trust and Intention Towards Mars Autonomous Systems; Collaborating with psychology professor
- Intent Manager for resilient autonomy expandable variable-autonomy architecture (EVAA)
- Operator Interface Design

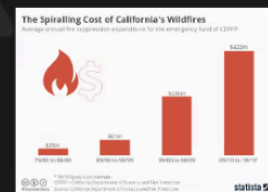
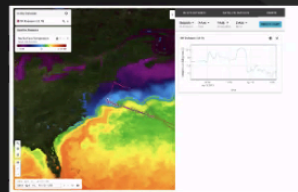
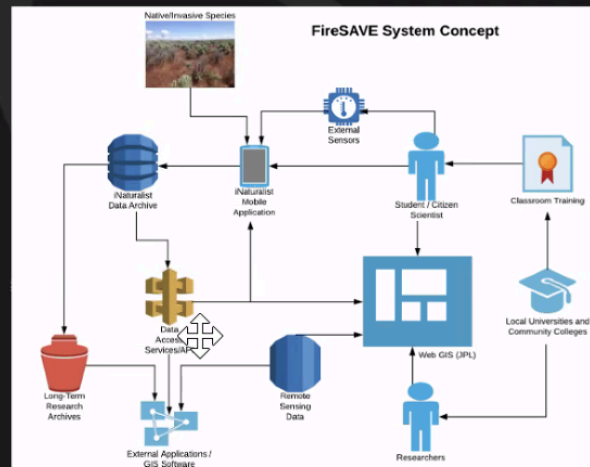
- Organizing Teamwork: Understanding operator and multi-robot team performance



- Visualization



Fire Student Active Volunteer Experiment (FireSAVE): Improving Fire Recovery Monitoring with In Situ Observations from Minority-Serving Institutions in California



arcs.center/autonomy-for-sustainability/

ARCS NASA

HOME ABOUT TEAM RESEARCH MEDIA + EVENTS SUPPORT ARCS JOIN

PRESENT PROJECT

WORKERS AND TECHNOLOGY TOGETHER (WATT)

Status: Ongoing

Student Researcher(s): Mitesh Sawant, Manufacturing Systems Engineering and Management, Douglas Cruz, Business and Economics, David Bell, Manufacturing Systems Engineering and Management, Melissa Baghoumian, Business and Economics, Jienhao Zhu, Manufacturing Systems Engineering and Management, Joshua Vazquez, Communication Design, Nitya Kumar, Business Administration, Fatima Arif, Electrical engineering, Kelana Sarmoy, Business Analytics

Collaborator(s): Los Angeles Local Enforcement Agency, Waste Management, Anaergia

CSUN CO-Is: Nhut Ho, Mechanical Engineering, Bingbing Li, Manufacturing Systems Engineering & Management, Farshad Ghodousi, Business Law, Joe Baulista Art and Communication, Sharif Moricca, Organizational Management

[VIEW PROJECT](#)

DIGITAL TWIN INTEGRATION OF OPENCAESAR AND INTREPID TO DESIGN AND ADDITIVELY MANUFACTURE THE MULTIPHYSICS OPTICAL TRACKER

Status: Ongoing

Student Researcher(s): Paula Logozzo, Mechanical Engineering, Max Slade, Anthropology, Ruitao Wu, Computer Science, Ting Hsun, Computer Science, Axel Fernandes, Engineering Management

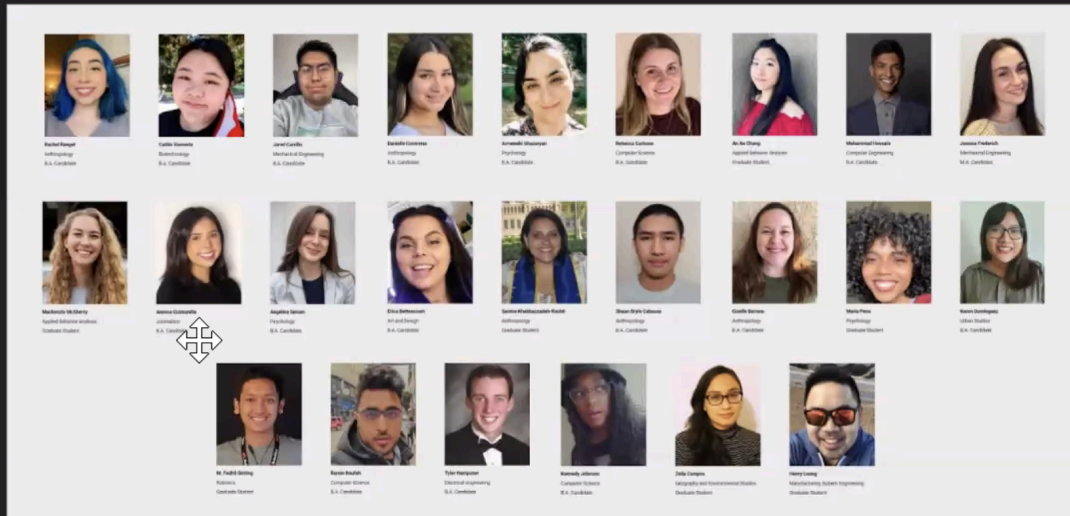
Collaborator(s): Dr. Maged Elaasar, Dr. Richard Otis at NASA JPL, Dr. Bhupen Lodhia, Mr. Marco Fiocco, Mr. Tomas Lay Herrera, Mr. Akmal Bakar at Autodesk

CSUN CO-Is: Bingbing Li, Manufacturing Systems Engineering, Nhut Ho, Mechanical Engineering

[VIEW PROJECT](#)

Lots of students and collaborators:

2020 – 2021 Student Fellow Cohort (67% female)



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4. There was one more project to share with the group but did not have time to do so.
5. The program started in 2020, mostly operated in Pandemic;
6. Part of the job is to get faculty members to get funded on these projects;
7. Q & A:
 - a. How did the project come together? - Learn while doing it and gradually put things together.
 - b. Ethics: how does the ethics issue become a topic of the agenda in NASA; - A lot of real world applications are related and was supported by Mark.
 - c. How about Entrepreneurship in the project? - There is a big effort on the entrepreneurship on STEAHM bubble. Currently people are still building infrastructure, can update in a year or two about the progress of the line of work.
 - d. If members of this TG are interested, how do they learn more about the projects? Nhut's email address: nhuttho@csun.edu
 - e. Dave Miller: If your student going to Harvard wants to visit me at Tufts in the fall, please have them reach out and come over! davebmiller@gmail.com

HFES HART TG invites you to our

Monthly Member Conversations



Tuesday April 26th 12:00-1:00 pm EDT
To join, DM for a zoom link.

April 26, 2022

Attendees: Lixiao Huang, Eric Holder, Maya Luster, Nancy Cooke, Heejin Jeong, Rob, David Grimm, Myke Cohen, Jamie Gorman, Matthew Scalia, Tia Larsen-Calcano, Shiwen Zhou, Dave Miller, Kara Latorella, Jayde King (a total of 23 people).

Agenda:

4. ~10 min lightning talk
5. ~20 min Q&A
6. ~30 min small group networking

Minutes:

1. We still have July and August lightning talk slots open. Welcome to volunteer or provide names for Lixiao to invite.
2. Jamie had 9 high level slides talking about the method in real-time measures and 3 domain applications. He calculate the dynamic patterns of a variety of measures, including psychophysical sensors and show the entropy pattern in real-time.
3. Jamie has been working with ASU and AFOSR on collecting robot dynamics data and human psychophysical data.
4. The results are not context specific and can be generalized to different domains, such as military, healthcare, and airforce, etc.
5. The most validated finding is about team's reaction time to perturbations, and identifying entropy peak value after pururbation happens. Jamie also studied resilience (defined as recovery time after perturbation happened). There is also another concept called energy.

6. Jamie also talked about future research applications on distributed dynamic team trust (Huang, et al, 2020), modeling the dynamics of trust and distrust on a team level.
7. We need to promote team dynamics early on in the human-AI-robot Teaming research.
8. Jamie is currently a professor at George Tech and he will join ASU in Fall 2022.
9. There are a few more questions asked by the audience but not captured in the minutes.

Mar 29th, 2022

Attendees: Maya Luster, Myounghoon Jeon (Philart), Lixiao Huang, Jessie A, Myke Cohen, Jamie Gorman, Lamar Harrell, J. Manganelli, Kelly Neville, Dave Miller, David Grimm, Jayde King, Hunter Rogers, Kathy Hayna, Ranjana Mehta,

Agenda:

1. Today's arrangement: no lightning talk, only small group discussions

Meeting minutes:

This is an informal social networking platform for all HART TG members. We normally start with a 10 min lightning talk followed by 20 min Q&A, and 30 min small groups. March 29 is the spring break for some regions and several speakers I invited cannot make it to this meeting. So we will skip the lightning talk and go directly to the small groups. By the way, all HART TG members are invited to give a lightning talk at least once.

HART TG provides the platform for any number of attendees who are interested in meeting. The minimum required number to meet is 3 people. The purpose is to know each others' research and seek feedback and advice.

Any questions before I open up the breakout rooms?

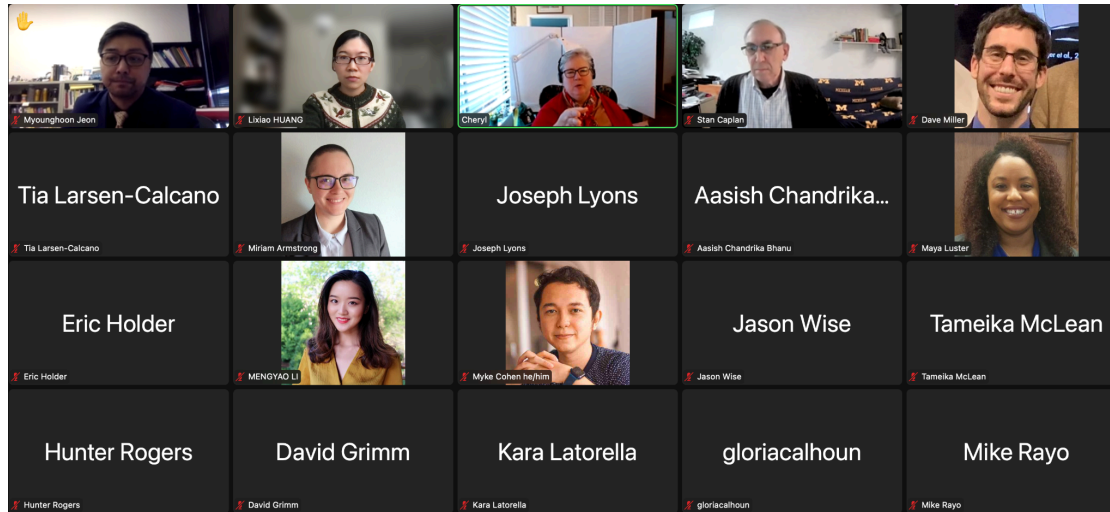
I will be in the main room if you need to be reassigned to another room.

Here are a few optional discussion questions for your reference:

- Introduce yourself, name, affiliation, and research interests
- Recent projects findings
- Interest in exploring anything new
- Other topics of interest to you

Feb 22, 2022

Attendees (please add your name here if not yet): My seeounghoon Jeon (Philart), Lixiao Huang, Cheryl Geisler, Maya Luster, Dave Miller, Eric Holder, Tia Larsen-Calcano, Hunter Roger, David Grimm, Kara Latorella, Mike Rayo, Jason Wise, Gloria Calhoun, Tameika McLean, Joseph Lyons, Stan Caplan, Mengyao Li, Mariam Armstrong, Asisah Chandrika, Myke Cohen



Meeting minutes:

1. Announcements
2. Resources: [Link to shared folder.](#)
3. Lightning talk:

Our Approach to Coding Verbal Data

- Stream: treat language as a phenomenon that unfolds over time
- Complexity: code language for what it does as well as what it means
- Context: interpret language in the context of production
- Systematic: take care to produce analyses that are replicable

Quantifying interpretation in pursuit of the recurrent

Workshop A: Coding Language Reliably

- Cheryl Geisler, Professor of Interactive Arts and Technology at Simon Fraser University
- Introduction to the rationale and limits of coding systematically
- Hands-on
 - *Serving as second coder of real verbal data involving humans and AI agents coded by Lixiao*
 - *Checking reliability between coders*
 - *Using patterns of disagreement to target revisions to a coding scheme*
 - *Revising a coding definition*

5

Workshop B: Computer-Assisted Code Development

- Jason Swarts, Professor of Technical Communication at NC State
- Introduction to techniques for data exploration and code development
- Hands-on
 - *Articulating research questions to drive your coding*
 - *Using tools of corpus analysis to discover lexical and syntactic variation on a data set*
 - *Developing a coding scheme with well-formed, concrete coding definitions.*
- Answers the questions: What does my verbal data look like and how can I code it to answer my research questions

6

Ok

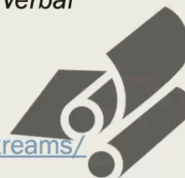
More in the Book

- Geisler & Swarts: *Coding Streams of Language: Techniques for the Systematic Coding of Text, Talk and Other Verbal Data.*
- Download from WAC Clearinghouse and Colorado University Press

<https://wac.colostate.edu/books/practice/codingstreams/>

- YouTube Channel at

https://www.youtube.com/channel/UCYi7qEAnSOvkMzCMogMkW5g/playlists?disable_polymer=1



Created by Ivan Garbev
from Noun Project

7

Questions:

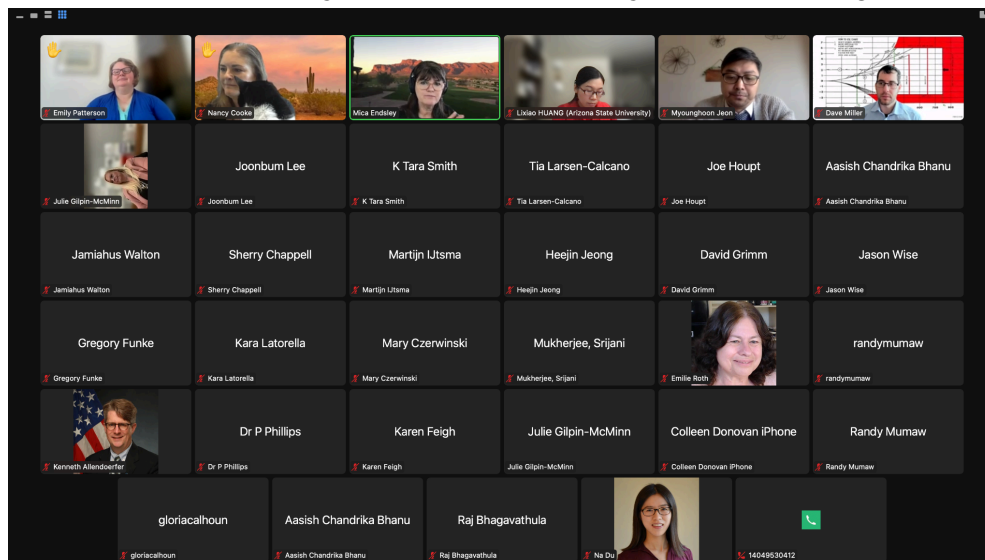
1. Cheryl asked Lixiao to share her experiences of using verbal data analysis; Lixiao shared one about learning through reflection journals; one using a mixed analysis method to study influencing factors for trust in an algorithm; both data analyzed the themes and frequency and change over time;
2. Maya: does the data have to be longitudinal? Can it be used to study acceptance to future technologies?
 - a. No it does not have to be, time is an additional dimension.
3. Stan: Have done some manual analysis, when can the machines help to replace my work?
 - a. Human coding is essential in the initial stage. Later stages could use some computer assistance and machine learning methods.
4. Joe: Manual coding is labor intensive. Used a tool called When would be a good time to use computer assisted tools?
 - a. Cheryl:

Followup:

1. Will send out interest survey

Jan 25th, 2022 Mica Endsley

Attendees (please add your name here if not yet): Lixiao Huang, Erin Chiou, Joonbum Lee

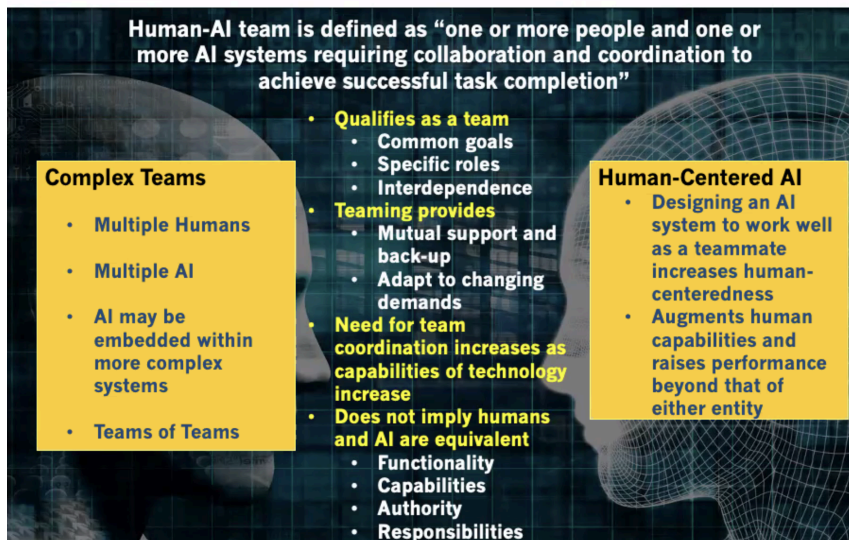


Meeting minutes:

1. FYI information In case someone did not know: The NAS Report on the State of the Art and Research Needs of Human-AI-Robot Teaming: The webinar happened on January 13, 2022. [The recorded webinar here](#) | [Read the Report](#) | [Report Highlights](#) | [More information about this project](#)

2. Highlights:

Why Human-AI Teaming?



Do you think AI can be a teammate or a tool? - It is not going to replace humans, but assist humans.

Emily Patterson: AI application in healthcare, billing system. You can do a better job, you can reduce the time, but you cannot automate the job for people. What you cannot automate is the transcription.

Nancy Cooke: AI should not duplicate what humans do, but to complement what humans do.

What's next after the report? - These are 100s of thesis topics to be carried out.

Human-AI Team Bias

