mediaX at Stanford University
H-STAR Affiliate Program

AI for Culturally Relevant Interactions

mediaX at Stanford University Forum
Mackenzie Room, Jen-Hsun Huang Engineering Center
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The practical and responsible limits of artificial intelligence are still in their early stages of development. A better understanding of the relationship between identity, culture and AI technologies can lead to dramatic improvements in how consumers, students and patients relate to information and to content, devices and services.

On October 17, 2018, mediaX convened thought leaders from academia and industry in the emerging arena of cultural and societal interactions with big data, machine learning and artificial intelligence for a Forum on AI for Culturally Relevant Interactions. The goal of the Forum was to move the human-AI relationship forward by bringing industry trailblazers together with Stanford cross-disciplinary thought leadership to examine and evolve concepts, technologies and practice used to integrate culture and identity with artificial intelligence and robots.

Important Questions for consideration included:

- *What cultural issues and concerns are critical for AI applications?*
- *How will consumers' relationships to brands be shaped by culture in AI storytelling?*
- *How does culture influence perception of human rights and privileges in the digital world?*
- *How can traditions, histories, and collective experiences shape an individual's experience of AI products?*
- *What elements of human culture can be emulated by artificially intelligent entities, particularly in a world of such varied human experiences?*

Our Cultures, Our Selves: Their Relevance for Humans and Artificial Agents
Hazel Rose Markus, Davis-Brack Professor in the Behavioral Sciences, Stanford University, Faculty Director, Social Psychological Answers to Real-world Questions (SPARQ)

Dr. Hazel Rose Markus, Davis-Brack Professor in the Behavioral Sciences and Faculty Director of the Social Psychological Answers to Real-world Questions (SPARQ) Lab at Stanford University, launched the conference with a discussion of the socio-culturally situated ways that people understand themselves, and the relevance of this understanding to our relationship to the interactive technologies of the future.

A self is the ‘‘me’’ at the center of experience, explained Dr. Markus. Our “selves” represent a continually developing sense of awareness and agency that lends meaning and coherence to our experiences and guides our actions. Our relationship to society and culture is cyclical and reinforcing – selves are socio-culturally shaped shapers of their world. This “Culture Cycle” includes four interactive elements - ideas, institutions, interactions and individuals. At the same time, selves are nodes in many intersecting culture cycles and are always multicultural.
Dr. Markus compared examples of middle-class, Western understandings of self and society, which are more “independent” with working-class Eastern conceptions, which are more “interdependent”. These understandings of self influence human behavior, she explained.

How people will relate to the interactive technologies of the future depends on their cultures and their self-understandings, Dr. Markus concluded. These understandings will influence many elements, including patterns of interaction, receptivity to feedback, and the capacity for innovation when responding to changing conditions. In particular, the predominantly Western, Educated, Industrialized, Rich and Democratic (WEIRD) perspective of social scientists will impact the technologies that they develop, including AIs and other automated agents.

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Dr. Markus’ presentation was followed by a Panel on “Insights from Embodied and Non embodied AI,” moderated by Elizabeth Wilsey, Community Network Specialist at mediaX. The four panelists included Annabell Ho, PhD Candidate in the Department of Communication at Stanford University, Mariana Lin, Character Designer for Sophia at Hanson Robotics, Cory Kidd, Founder & CEO of Catalia Health, and John Ostrem, Co-founder & CEO, AvatarMind. Each

panelist spoke briefly about their work, followed by a discussion with the moderator and the audience.

Does the Supportive Partner's Identity Matter? The Effects of Chatbots vs. Humans
Annabell Ho, PhD Candidate, Department of Communication, Stanford University

Ms. Ho described research comparing people's interactions with supporting agents – either other people or chatbots. Her research into emotional and factual disclosure found that, in many cases, results of disclosure are similar, regardless of the agent. When people talk about their feelings to a chatbot instead of another person, they can feel just as good after getting supportive responses and just as bad after getting unsupportive responses. Consequently, Ms. Ho recommends that AI should be built with care to provide truly validating responses, since invalidating responses can be harmful even if people know the partner is a computer who doesn't "know any better". In some contexts, the identity of the partner does matter. Ms. Ho advocates for additional research to better understand these contexts to make sure that supportive AI is safe and effective. Key variables include different lengths of interaction, the relationship with the partner or agent, different types of situations, and individual differences. AI should be built with careful thought about how it would impact the person's relationships, not only with the AI itself, but with other people, Ms. Ho concludes.

Creating AI Personalities
Mariana Lin, Consultant, Character Designer for Sophia, Hanson Robotics

Mariana Lin shared her experiences in creating the AI assistant Siri for Apple. Siri is designed for interaction with people from all over the world. This experience gave Ms. Lin a global perspective on people's driving questions and thoughts. Crafting AI personalities, Ms. Lin realized, gives us an opportunity to look at human culture and identity from a new stand point - "what would an alien being think of the way humans categorize and organize ourselves?" Ms. Lin's experience gave her a sense of what people wanted – from each other, and from themselves. They gave her insight into similarities and differences, across interactions and cultures. They demonstrated where language has its limits for interaction, as well as the different ways that people around the world perceive relationships and communication. Ms. Lin

noted that emotions unify the human experience and offer a way to bridge differences across cultures. Understanding the role of emotion is powerfully important for designing AI interactions. Similarly, embodied AI needs to take more visual care in recognizing biases and being broadly culturally appealing. Anthropomorphism changes interaction, Ms. Lin noted. The more anthropomorphic the AI is, the more this is both a concern and opportunity.

Long Term Health Coaching Relationships
Cory Kidd, Founder & CEO, Catalia Health

Cory Kidd described the work of Catalia Health, which has developed a friendly and interactive robotic wellness coach named Mabu for patient home use. Mabu provides tailored conversations to each patient that evolve over time. Catalia Health created an identity for Mabu that takes into account the existing constructs of health givers, but has a unique voice. "We start with what a doctor or nurse might ask a patient about, or inform them of, and build conversations from there," explained Dr. Kidd. Leveraging both doctors and nurses is helpful because each has a different relationship with a patient, he added. Designing a wellness coach like Mabu involves understanding the psychology of human interaction with robots, as well as the context for differences with human-to-human interactions. Catalia Health has found that many of the psychological effects of human interactions translate to interactions with robots, especially over the long term.

Making Robots Sociable
John Ostrem, Co-founder & CEO, AvatarMind

John Ostrem shared insights from the development of iPal, a humanoid robot designed for social interaction in educational, elder care, hospitality and retail environments. Designers of iPal explored the characteristics of a social robot. "What is needed to make robots fit into society in such a way that they can interact effectively with people and be accepted as part of everyday life?" they asked. Mr. Ostrem explained that a social robot needs to perform useful functions and interact with humans in a way that is comfortable and gives confidence. Being perceived as non-threatening, friendly and safe are key factors. The robot also needs to interact with humans through modalities that humans recognize. These factors include the robot's

ability to adapt to the environment, recognize and remember people, detect and respond to emotion, converse, form "social relationships," have a personality, and use body language and tone.

Discussion

Group discussion highlighted the importance of culture for the design of interactive robots, chatbots and other AI. Cory Kidd noted that we are in the early days of tailoring models to adapt to individuals. There are so many different types of intelligences (social, emotional). We are only just beginning to know how people know what they know. In addition, people have layers of identity, and Human/Robot Interaction depends on variations in people, as well as robots. There is power in personalization and building strong relationships.

Marianna Lin noted that designing robots provides us with an opportunity to approach the idea of the self with an outsider, anthropologist-type perspective. Designing robots helps us understand humans better. Through the global use of AI, there is an opportunity to create a pan-global culture. This raises a number of ethical, philosophical questions. What would that culture look like? Should AI simply reflect back what people want – or should it consider what they need or could benefit from?

In response to an audience question on human/robot rituals, the panel suggested that those are being created now, through our interactions. The audience also wondered if panelists were optimistic or pessimistic about our future with AI's. Panelists argued that it is important for the builders of AI to ask the tough questions. The goal is to develop robots that are our friends, not our competitors. It's in society's best interest for designers to create experiences and collaborations that use AI to enhance and augment people, so that the total is greater than the sum of the parts.

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The Panel was followed by a series of six Lightening Talks on "Expressions of Culture and Identity –Language, Images, Perception" featuring thought leaders from Stanford and industry.

Crazy Like Us **- Ethan Watters, Author**

Mr. Watters described how key findings from his book, *Crazy Like Us,* apply to to the design of artificial intelligences. In *Crazy Like Us,* Mr. Watters explored the cultural shaping of cognition, and the globalization of Western understandings of mental illness.

Mr. Watters shared the impressive body of evidence suggesting that mental illnesses have never been the same the world over (either in prevalence or in form) but are inevitably sparked and shaped by the ethos of particular times and places. As AI becomes a diagnostic tool for psychiatry, he argues, these cultural differences need to be taken into account.

The cultural shaping of the human mind goes beyond mental health symptoms. Researchers have begun reveal wide cultural differences almost everywhere they look: in spatial reasoning, the way we infer the motivations of others, categorization, moral reasoning, the boundaries between the self and others, and our deeply held beliefs about the nature of the self, among other aspects of our psychological makeup. Understanding the cultural impact on human cognition will become increasingly important as we train computer systems to mimic human reasoning, thought processes and intuition.

Inviting "We The People" To AI **- Davar Ardalan, Founder & Storyteller in Chief, IVOW**

Davar Ardalan founded IVOW with the mission of integrating identity, culture and "soul" into the development of AI driven products. Ms. Ardalan and her team propose a Deeply Inclusive AI (DiAi) that infuses diverse cultural knowledge into automated intelligent storytelling. This approach, she argues, not only contributes to a more inclusive and ethical society - it also makes for sound business strategy as industries better understand each of their customer's needs and motivations. A deeper understanding of every customer's personal story and cultural background is vital for competing in a marketplace increasingly shaped by Artificial Intelligence. It will take collaboration across industries to make DiAi a reality.

Considering the Analog World of Emergent A.I. **- Antero Garcia, Assistant Professor, Stanford Graduate School of Education**

Professor Garcia spoke about the iterative social aspects of creating analog and digital tools and technologies. Algorithms and AI are authored texts, he noted. They are written by individuals and carry with them implicit values, biases, and ideologies. At the same time, how we adopt new technologies is an iterative process of learning. These devices teach and influence us and our analog values and world-views, as we use them. With that in mind, he argues that we when we talk broadly of cultural relevance, we need to be mindful of whose culture is counted and what we mean by "relevance". In addition, our vocabulary when discussing technology needs to be challenged: what does it mean to "adopt" new technologies? What does "humanizing" mean in today's software world? Dr. Garcia recommends we look closely at how we are seeking to unpack biases in research and design. He recommends we consider the relational & humanizing opportunities afforded by new tools, and the embedded lessons taught by new AI, algorithms and technologies.

***AI-Powered Interactive Media: The Verge of a New Era* - Albert Boyang Li, Senior Research Scientist, Baidu Research**

Albert Boyand Li described how he leverages a background in Computational Narrative Intelligence and Machine Learning to help Baidu change the way viewers understand and engage with entertainment media. The way viewers interact with TV shows and movies has changed little in the past 60 years or so, he explained. Today, abilities for automatic understanding of video and story content now have the potential to enable new interaction paradigms. His work involves the development of new platforms that open new possibilities with huge impact. In particular, he and his team are currently developing AI enabled intelligent video summaries that help users fast forward to a desired point in a program. In addition, they have recently developed new algorithms that can compute the versatility of actors and their similarity from metadata. New algorithms can also align the video and textual data which are abundant in the traditional production process, so that they can now be jointly processed and understood.

***The Politics of Algorithms* - Angèle Christin, Assistant Professor, Department of Communication, Stanford University**

Dr. Christin works in the emerging field of society and technology; examining how new

technologies change society and how society changes new technologies. Social and political forces always shape technology artifacts, she explained, and, simultaneously, these technology artifacts shape social infrastructure. Her research focus is on how algorithmic technologies shape the way we work and interact with each other. This begins with the complex task of defining the term "algorithm," which she describes as the procedure or set of rules for performance of a task. Algorithms may seem more objective and rational than human beings, she observed, but they always involve multiple political choices. Algorithms can, for instance, reproduce and even reinforce social, racial, and economic inequalities. Consequently, we need to pay close attention to how algorithms are constructed, implemented, and used in the social world.

***Culture on Demand* - Jordanne Pavao, Product Manager, Flybits**

Jordanne Pavao described how Flybits leverages AI capabilities to create a "high impact customer experience" with their Experience Studio. Customer expectations have evolved, Ms. Pavao explained. Customers expect more data, on smaller screens, with 3 dimensional, non-linear micro interactions. Enterprises that seek to serve today's customers need to deliver sophisticated customer experiences that leverage contextual data to become micro-personalized. Delivering this type of customized, context specific, personalized and situationally aware "just in time" information to the consumer represents the next step in the customer engagement experience.

Flybit's Experience Studio addresses this need by creating a deeply sophisticated system that unifies proprietary and public data in one easy-to-use dashboard. The Experience Studio works to aggregate data models and ecosystems in order to simplify the complexity of data verification, so clients can focus on customer experience. Its goal is to create an impactful narrative experience that easily and simply unifies data on customer identities, situations and needs from disparate sources. The engine behind the Experience Studio also leverages AI and machine learning to generate predictive models that provide recommendations in order to refine or augment the experience. AI will change the way companies operate in the future, Ms. Pavao concludes. We are only just scratching the surface of what will become possible.

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The Lightening Talks were followed by a Fireside Chat on "Translating Code in Culture for Brand Meaning" with leadership from Getty Images. Elodie Storm, Senior Director of Strategic Development at Getty Images, was joined by Andrea Gagliano, Getty Images' Data Scientist in Visual Intelligence, in a conversation moderated by mediaX Communications Director Jason Wilmot.

Ms. Storm and Ms. Gagliano described how Getty Images has been using AI to make the process of image curation and discovery easier, at scale. Getty's approach to "scaling creativity" has been to leverage AI to automate specific rote tasks, so that human users could make the appropriate, nuanced creative choices more easily. Getty's has developed this methodology by considering what machines are good at automating, and the kinds of tasks and choices that humans are better at doing. Getty's "Curation with Inspiration" AI platform associates images with text, and then suggests images for users based on key words in their copy. Humans make the actual selections, using the images curated by Getty, without having to stop and conduct a time intensive search on their own. Their data set associates Images not only with objects, but with feelings and concepts as well. Getty has found that the images its engine recommends can be surprising and not obvious, and this in itself can offer creative inspiration. Their AI has also been trained to identify differences between authentic and stock images. Building culturally-aware AI in the creative field requires collaboration between people and technology, they explained. This process raises important questions about image choice. For instance, in terms of representing diversity - should search results be realistic or aspirational?

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Workshop Activities

An afternoon workshop enabled audience members to engage with each other and with some of the key ideas raised at the Forum.

Workshop participants formed teams at different tables. At each table was a photo of a hypothetical user, each from a different cultural background. The team's objective was to

create an AI agent and design a short online interaction that would be culturally relevant to the user in the photo. After some time to work on their project, each team selected a representative to describe their user, their agent, the interaction that they created, and how/why a cultural understanding of their user makes the interaction effective.

Although teams and photos were diverse, a preference emerged for a coaching role for the AI. In most cases, participants acknowledged that they were not from the same cultural group as the people depicted in the photo. With the desire to design for inclusion, many teams recommended involving people from the user's culture in the process of interaction design. One exception was a team from China, which came up with a detailed interactive scenario leveraging their cultural understanding of the "Spring Festival" featured in their photo.

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Dealing with Errors, Fairness, Explainability and Testing of Machine Learnt Models

Rama Akkiraju, Director, Distinguished Engineer, Master Inventor, IBM's Watson Division

In the final presentation of the day, Dr. Akkiraju shared insights from her experience with IBM's Watson Division, with a focus on reducing bias and increasing explainability and fairness in AI technologies. Humans are an integral part of building AI models, Dr. Akkiraju explained. Their personalities and their backgrounds all make their way into AI models via labeling, data selection, data source identification, feature selection, etc. AI models can learn from data (both structured and unstructured). Where data is the fuel, algorithms are the engine.

Since AI development requires a constant series of choices and decisions, Dr. Akkiraju explained, bias is inevitable. The challenge lies in identifying, defining and measuring which biases are acceptable and what constitutes *undesirable* bias. Biases can occur all along the machine learning data pipeline, she added, from collection to selection, to annotation, to enhancement, to quality check. Biases can also be found in the data used for algorithm testing and training, in the features, as well as in the algorithmic models. Developers should build tools

to detect, measure and report biases, and should consider how to mitigate biases once they are detected.

Best practices for this process include setting goals in advance, Dr. Akkiraju explained, by starting with test cases and ground truth. Developers should try to pre-define bias attributes as much as possible, considering unknown biases as well. Error analysis involves examining the types of mistakes the model is making. De-biasing techniques depend on the type of error, as well as metrics such as data augmentation, data synthesis, and data quality measurement. One question developers ask is if they should build opaque statistical deep-learning models and try to explain their predictions after-the-fact, or if its better to take the time and effort to build transparent models that explainable from the get-go? This decision is context specific, Dr. Akkiraju explained.

Dr. Akkiraju recommended that developers declare any known biases in training data up front, so that expectations are accurately set and users know what they are getting. She urged developers to be diligent with error analysis. If it's not possible to fix all the errors, at least fix the ones that matter. Finally, developers should plan for continuous improvement - AI Models rarely get it right in first iteration.