

Understanding how to understand teammates

Eric Fosler-Lussier

Ohio State

Agenda: Human-Machine Teaming for Complicated Workflows

Human-machine teaming looks at partnership

How can automated agents facilitate decision making?

What can work with pathology workflows?

What **should** work with pathology workflows?

How do people partner with machines in conversation now?

How will people conversationally partner with machines in the future?

What are the challenges?

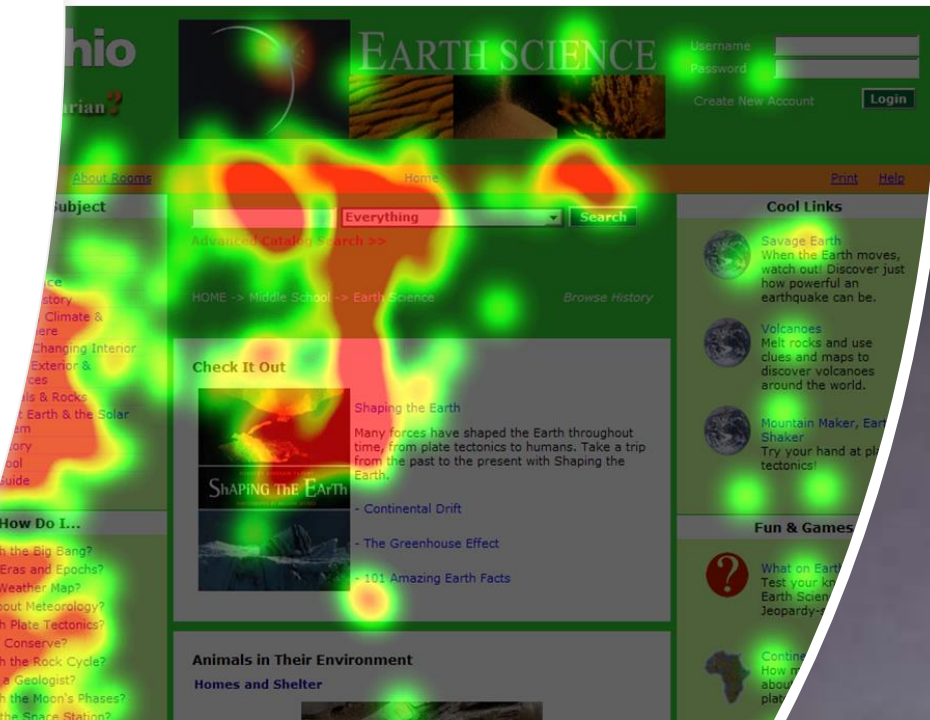
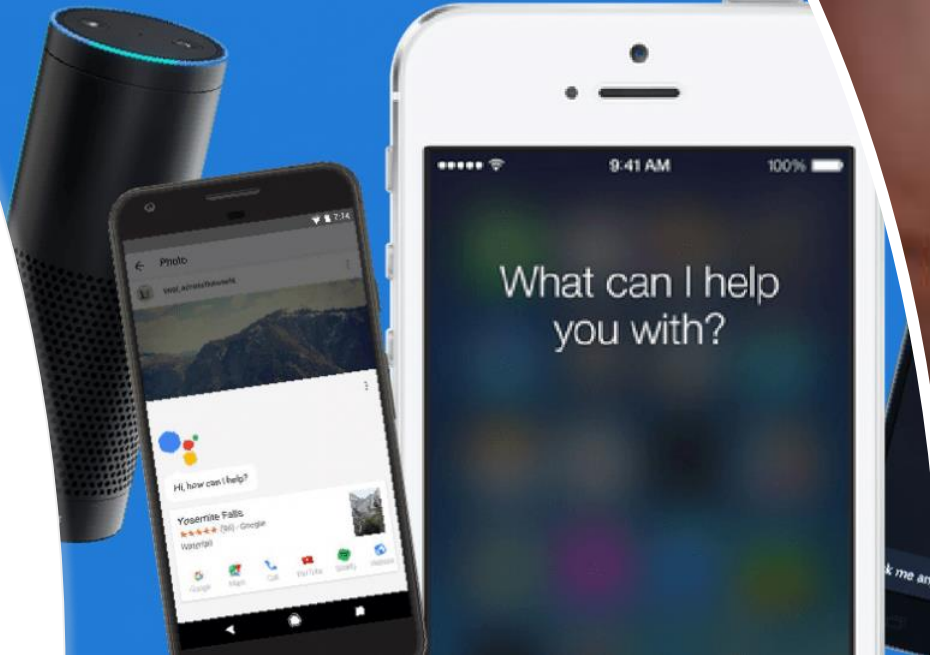
How do we learn with sparse data examples?

Today's interactive capabilities

We are starting to see increased ability to interact with devices via different modalities like language, gestures, and eyetracking.

Costs

Abilities

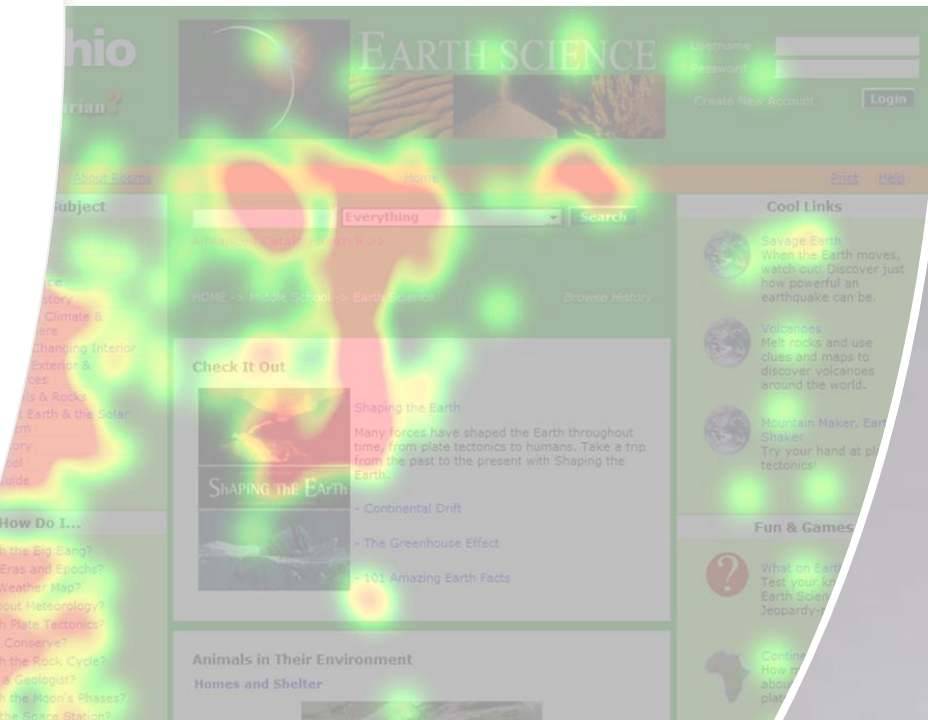
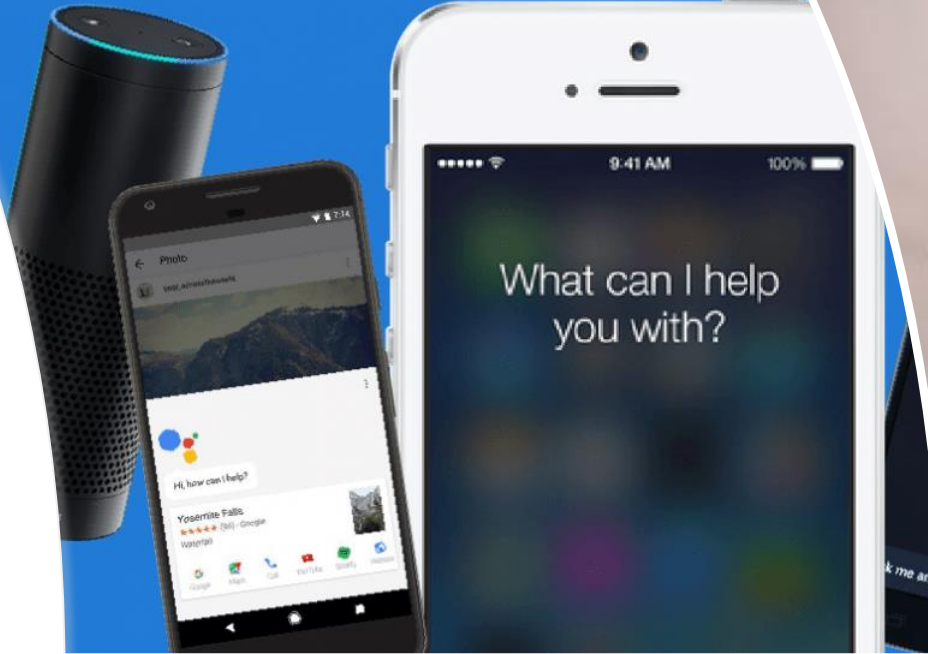


Today's interactive capabilities

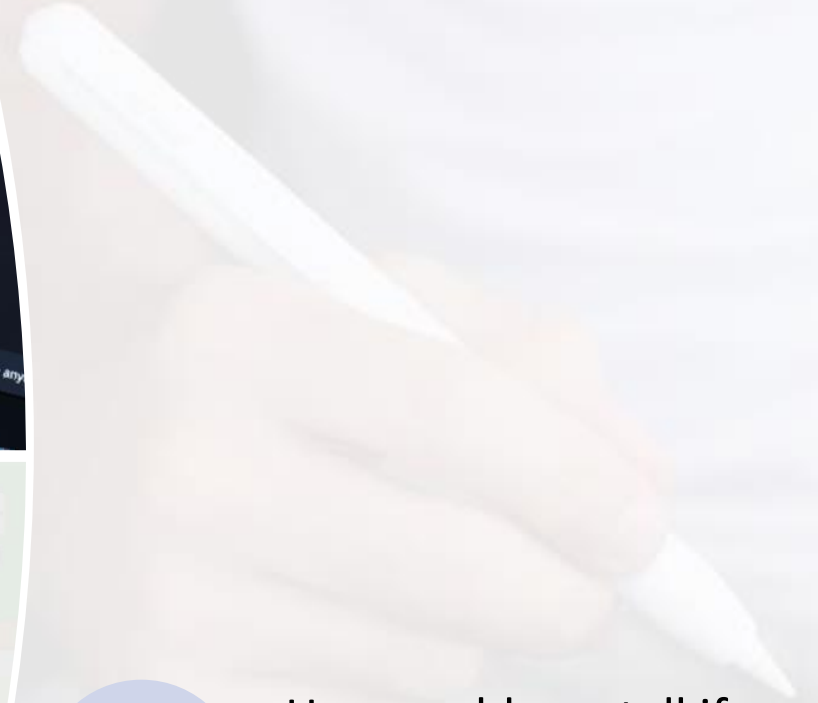
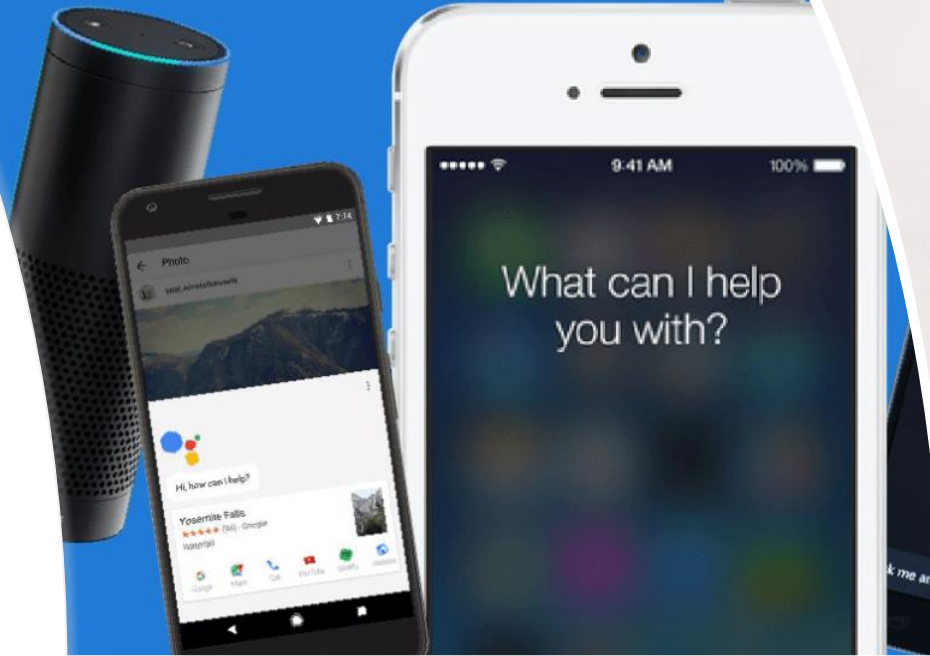
We are starting to see increased ability to interact with devices via different modalities like language, gestures, and eyetracking.

Costs

Abilities



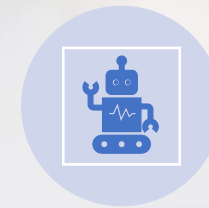
In your last conversation with a virtual agent...



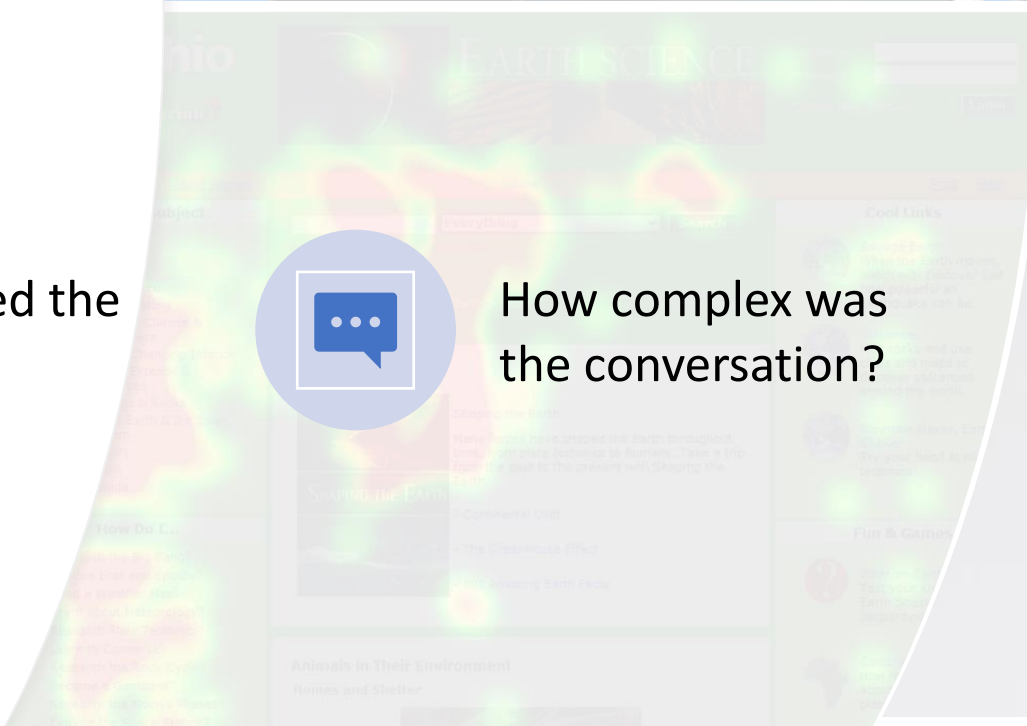
Who controlled the conversation?



How complex was the conversation?



How could you tell if the machine understood you?



Helping medical students learn: Virtual patients

OSU medical students practice taking medical histories

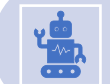
Allows practice before testing with (human) standardized patients



Who controlled the conversation?



How complex was the conversation?



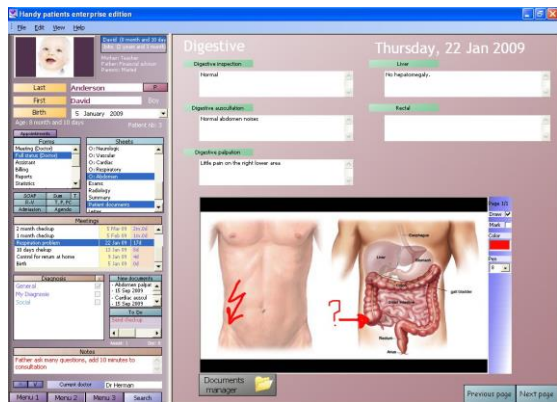
How could you tell if the machine understood you?



What might pathology team conversations look like?



This Photo by Unknown Author is licensed under [CC BY-SA](#)



This Photo by Unknown Author is licensed under [CC BY-SA](#)



This Photo by Unknown Author is licensed under [CC BY-NC-ND](#)



This Photo by Unknown Author is licensed under [CC BY-SA](#) This Photo by Unknown Author is licensed under [CC BY](#)



What are the challenges?

Utility of partnering

How do we build effective (machine) team partners?

How do we build trust?

How do we teach systems to be proactive?

Mixed initiative systems

When should computational partners listen?

When should computational partners suggest things?



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

What are the challenges?

Integrating information from multiple modalities

Deixis: this, that, there

Timing: how does coordination between modalities matter?

Gesture, eye gaze, language as attention mechanisms

Technical challenges

Explainable AI systems: generating explanations

Making systems more robust to uncertainty and error

Modeling and communicating uncertainty

Building systems with little data

Long tail distributions in language – many events are rare