



Università degli Studi di Cagliari
Dipartimento di Matematica e Informatica



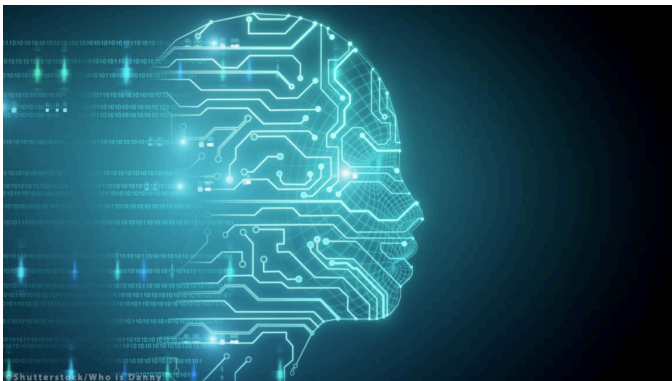
Opening the AI Blackbox for a Better HCI

Two themes for developing the HCI for AI Syllabus

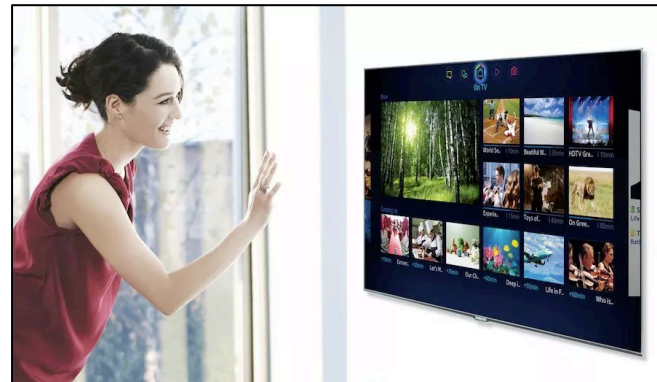
Federico Maria Cau e **Lucio Davide Spano**

davide.spano@unica.it

The two themes



Explainable AI

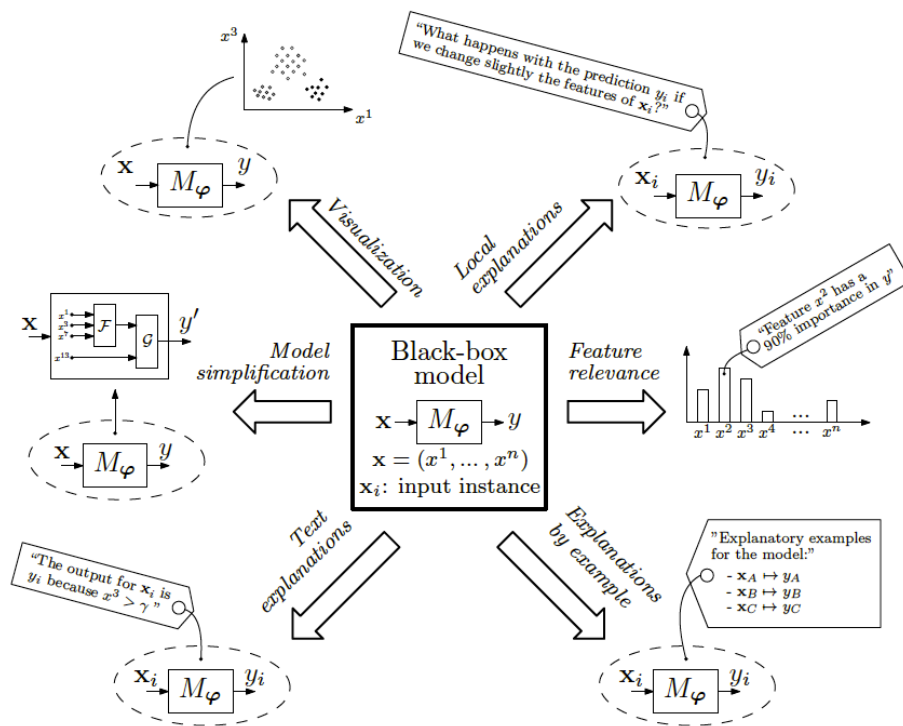


Gesture Interfaces

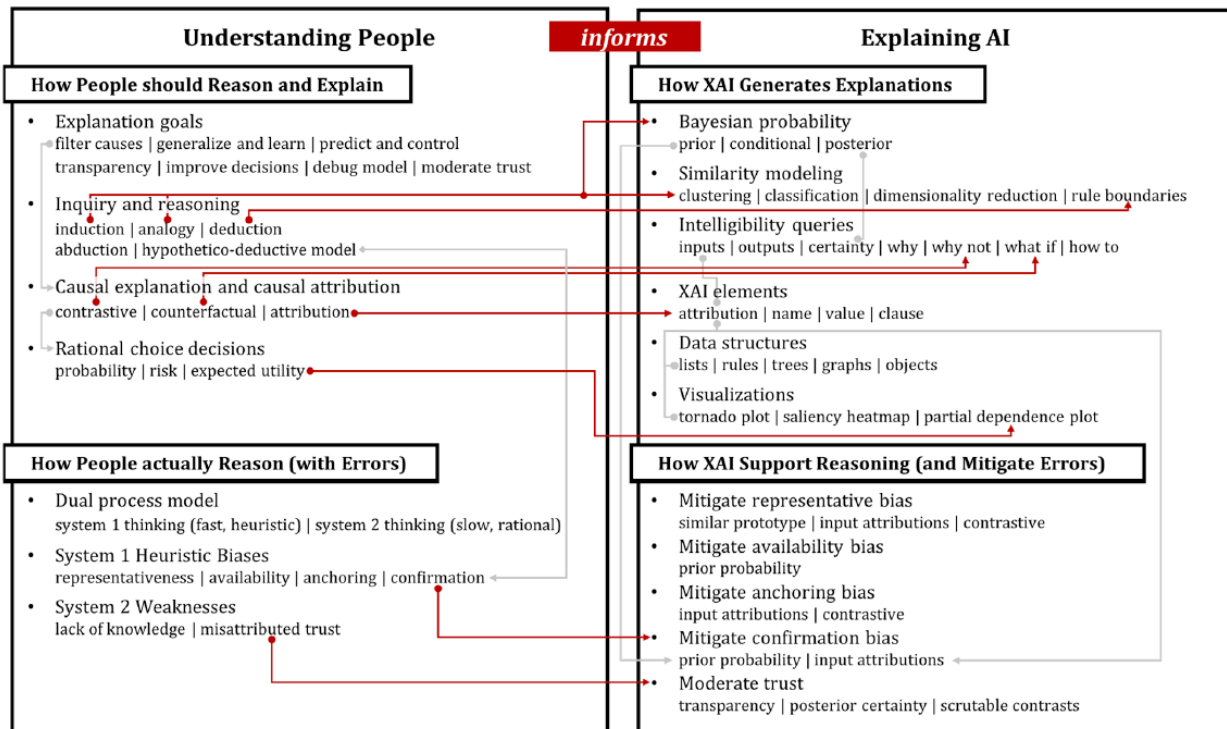
Explaining Black Box Models

Conceptual diagram showing the different post-hoc explainability approaches available for a ML model M

Arrieta, Alejandro Barredo, et al. "Explainable Artificial Intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI." *Information Fusion* 58 (2020): 82-115.



Conceptual Framework



Conceptual framework for Reasoned Explanations that describes how human reasoning processes (left) informs XAI techniques (right).

Danding Wang, Qian Yang, Ashraf Abdul, and Brian Y. Lim. 2019. Designing Theory-Driven User-Centric Explainable AI. In Proceedings of CHI 2019, paper 601.

Evaluation: Proxy VS Real Task

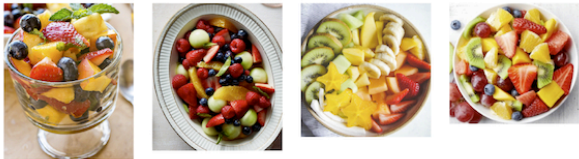
Proxy

The AI must decide: Is 30% or more of the nutrients on this plate fat?

Fact: 30% or more of the nutrients on this plate is not fat.



Here are examples of plates that the AI knows the fat content of and categorizes as similar to the one above:



What will the AI decide?

Real

Is 30% or more of the nutrients on this plate fat?



Here are examples of plates that the AI categorizes as similar to the one above and do not have 30% or more fat:

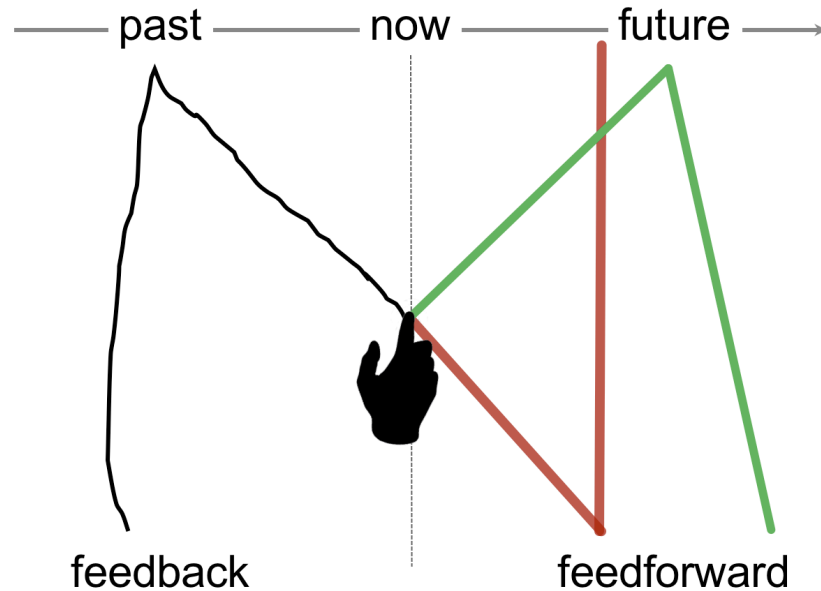


This AI recommended answer is:
NO, 30% or more of the nutrients on this plate is not fat.

What is your decision?

Zana Buçinca, Phoebe Lin, Krzysztof Z. Gajos, and Elena L. Glassman. 2020. Proxy tasks and subjective measures can be misleading in evaluating explainable AI systems. In *Proceedings of IUI '20*. (ACM) 454–464.

Engineering Interactive Systems



Carcangiu, A., Spano, L. D., Fumera, G., & Roli, F. (2019). DEICTIC: A Compositional and Declarative Gesture Description Based on Hidden Markov Models. *International Journal of Human-Computer Studies*, 122, 113-132.

Dessì, Stefano, and Lucio Davide Spano. "DG3: Exploiting Gesture Declarative Models for Sample Generation and Online Recognition." *Proceedings of the ACM on Human-Computer Interaction* (2020).



Thank you!