



FEAST: A Flexible Mealtime Assistance System Towards In-the-Wild Personalization

R. K. Jenamani,¹ T. Silver,¹ B. Dodson,¹ S. Tong,¹ A. Song,¹ Y. Yang,² Z. Liu,¹ B. Howe,³ A. Whitneck,³ T. Bhattacharjee¹

¹Cornell University, ²University of Michigan, ³Independent researcher (care recipient)

TL;DR – FEAST enables care recipients to personalize mealtime assistance across diverse in-home scenarios with minimal researcher intervention.



EmPRISE Lab

1 Robots can Help with Activities of Daily Living

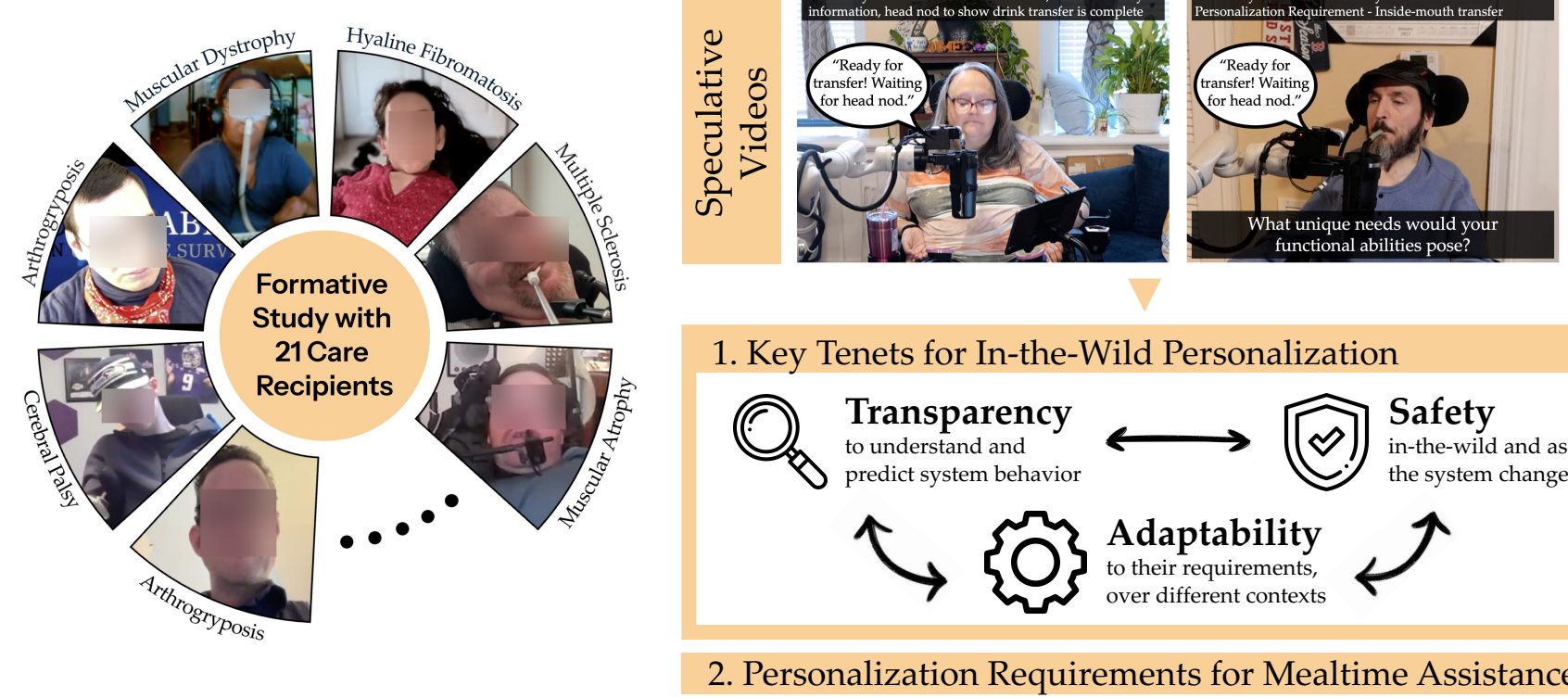


“1.3 billion people experience significant disability. This represents 16% of the world’s population, or 1 in 6 of us. Between **2% and 4% experience significant difficulties in functioning.**”

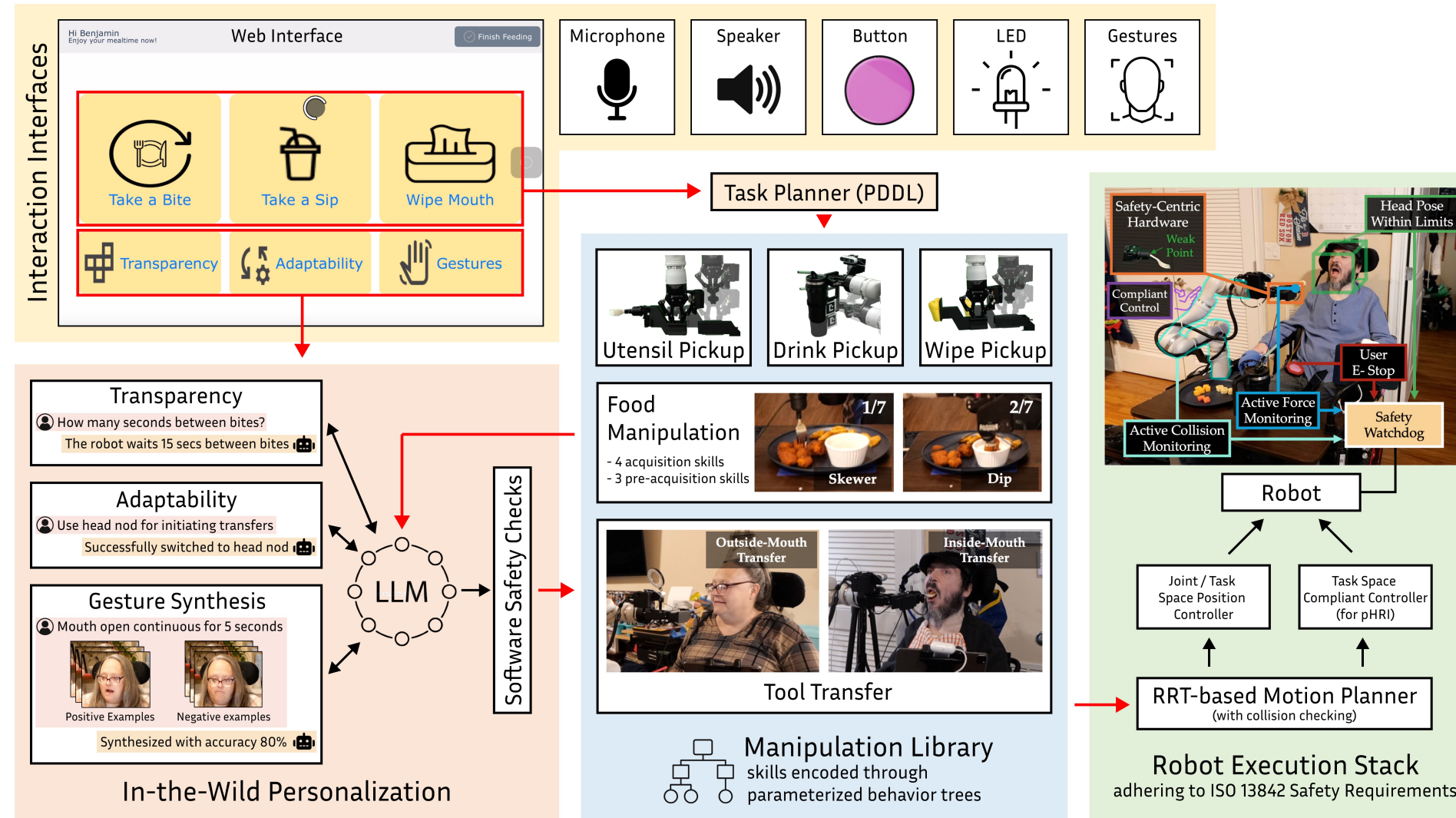
- WHO World Report on Disability

However, despite decades of research, autonomous physical **caregiving robots remain stuck in labs.**

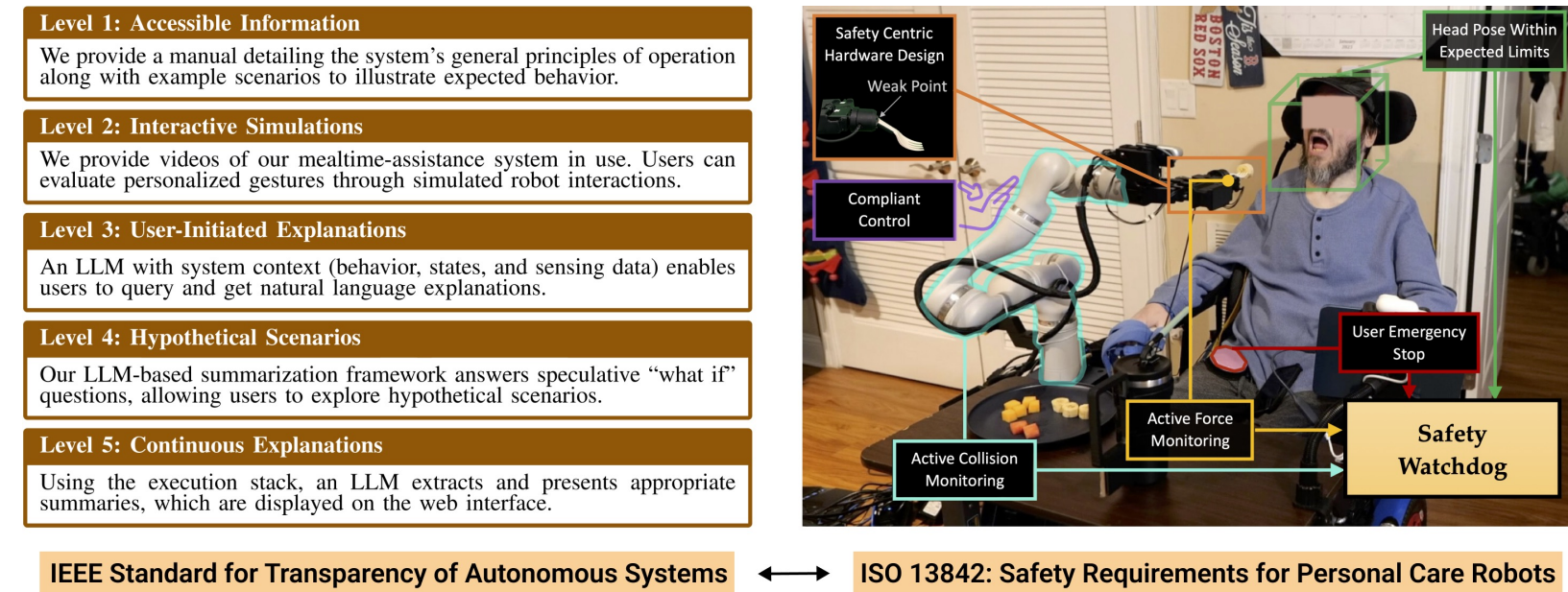
2 Shaped by Community Researchers and a Formative Study



3 Designed for Personalization in Both Hardware and Software

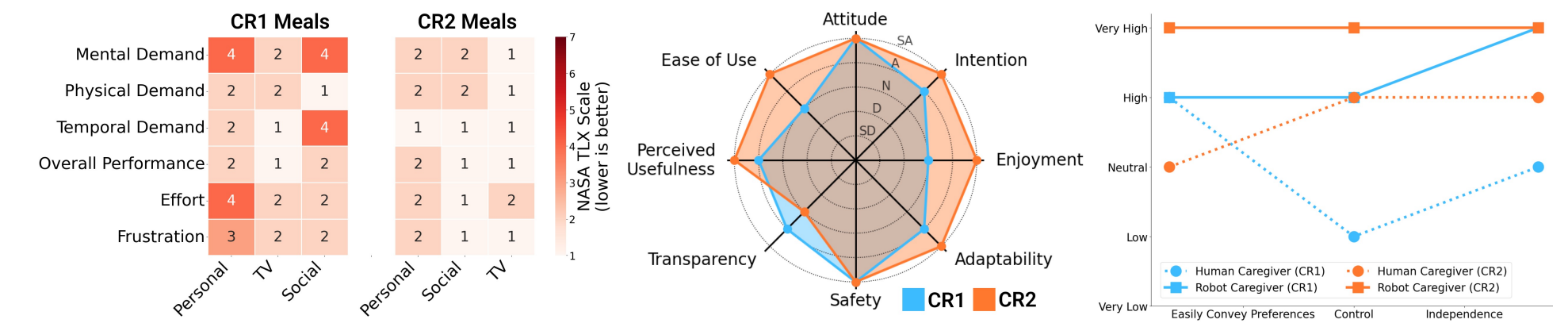


4 Tackles the Three Tenets of In-the-Wild Personalization



	Mealtime Tasks			Interaction			Hardware			Acquisition			Transfer			Miscellaneous		
FEAST (ours)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nanavati et al. [30]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
FLAIR [20]	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

5 Five-Day In-Home Study with 2 Community Researchers



Lesson 1 Significant variability exists across users and in home eating scenarios, and in-the-wild personalization allows users to uniquely adapt the system to these variations.

Lesson 2 Transparency helps users iteratively refine the system to meet their preferences, even when adaptability commands are not always effective.

Lesson 3 Providing multiple interfaces is essential for transparency, as users may not always be able to interact with a single interface due to situational and environmental constraints.

Lesson 4 Cognitive workload generally decreases as users become more familiar with the system, but it also depends on the context and specific settings they choose.

Lesson 5 System failures can occur in-the-wild for various reasons, but system flexibility and keeping the user in the loop improves the robot’s ability to recover.