1. Just want to say an incredibly, sincerest thank you to the education coordinators, the technical team, and everyone else who shared their time with us.
2. Motivation - Share the Story
    a. On July 16th, 2013 Italian Astronaut Luca Parmitano terminated his spacewalk 44 minutes in due to the build up of 1.5 liters of water in his helmet. This emergency was unprecedented, and required the problem solving cooperation of EVA,IVA and ground control. While this emergency was successfully handled by ground control, as we venture farther from Earth, we will need new ways to bring the expertise of ground control with us.
3. Problem Statement
    a. How might we empower astronauts to address emergency situations in space?
    b. The nature of EVA's is changing, as NASA embarks on missions to the Moon and Mars. Astronauts will have to operate more Earth-independent, while preserving (if not improving) efficiency and safety on EVA.
4. Our Approach
    a. Why it is unique
        i. Human Centered Design considers how people will operate within the system, not just as operators and designers, but as users and people impacted by it. HCD starts from a 30,000ft system view, defining a problem space and then applying design strategies to create and quickly iterate on solutions.
5. Prototype
    a. We made a prototype that proposes extending astronaut cognition and perception via a tightly integrated human/machine relationship and robust informatics system.
    b. We designed an EVA guardian angel mode.There were three human-computer interaction paradigms tested:
        i. Dynamic adjustment: Task lists and procedures aren't always linear steps, but decision trees or loops. This is hard to represent in a traditional list format. Our system dynamically updates task lists based on the environment and human feedback.
        ii. Preserve and promote autonomy. Our translational feature annotates 3D, not speroid objects, clearly demarcating the waypoints (handholds) on the space station. The translation feature is an aid, allowing the users to choose how they navigate through the environment with machine assist, because especially in emergencies, the environment might be dynamically changing and the human is best at interpreting that information.
        iii. Contextual information, surface the information as it is relevant. We tested with biometric monitoring. While the suit measures personal biometrics during the whole EVA, it's only relevant if something is off nominal. And it's often not your own health but a partner's that can be relevant.
        iv.

        1. This week we were in ground control, and we heard from a flight controller how automation can get you so far but ultimately it relies on humans...Because of the latency, we can't rely on ground control as we move farther away from the Earth, this becomes a portable, personal ground control. We aren't automating to put astronauts on autopilot but to respond.
6. Why is this valuable to NASA
    a. Portable ground control
    b. Embracing the NASA paradigm of redundancy
    c. It's not about putting a screen in front of the face but augmenting vision in the literal sense
    d. We are providing the start of a human computer interaction design framework for NASA for emergency situations, and it are kernels of learning that can further be applied to other opportunity spaces in EVA.
    e. And if you want to learn more or talk about this framework with us, you can email the wonderful team here [transition to team slide with email at top]
7. Our team
    a. Unique skill set
8. Conclusion & Thank you to NASA
    a. Closing image could be our instagram page
    b. Inaugural team from Harvard