SLIDE 1: INTRO

SLIDE 2: GOAL

space flight is a burgeoning industry in need of updated flight command interfaces.

physically manipulated interfaces can be time consuming, physically challenging to reach in sub gravity environments, and have a steep learning curve to become familiar with.

STARFare aims to deploy a command interface which takes user input in the form of voice commands, bypassing the need to physically interact with the console and improving execution times while increasing command across multiple types of users.

STARFare is currently being developed for space flight but can be adapted to all kinds of navigational interfaces soon.

SLIDE 3: SOURCES

due to our inspiration from the computer interface in star trek, we used existing technical data from the show to create an interface which many people may have familiarity with through the popular series.

many voice interfaces such as alexa, cortana, and google assistant already exist and are widely used.

potential user interviews helped us to identify concerns from users and to highlight voice interface features that they find useful.

our previous work on NavAssist, a voice command navigational device for the visually impaired, provided the frame for our STARFare project.

SLIDE 4: RESEARCH

STARFare must be able to understand all kinds of accents and regional dialects. accents have been a problem for other voice interfaces (e.g., alexa and its difficulties with scottish accents.)

the main reason for users to not use existing voice interfaces is lack of accurate interpretation of user’s voice. lack of accuracy is main killer of voice command projects.

drawing from our use of star trek as a source, simplicity and ease of use are key to creating an interface which will be used for navigation. the computer from star trek is straightforward, non-threatening and simple to use, which we aimed to emulate as well.

SLIDE 5: USER INTERVIEWS

both interview subjects showed hesitancy to trust a navigational system to voice commands.

when asked what could be done to increase trust in the interface, both subjects stated that they would need to repeatedly see that the interpretation of their commands was 100% accurate.

much of the subject's hesitancy came from poor experiences with existing voice command technology (e.g., alexa, cortana, etc.).

providing a way to interact manually with the interface would increase trust in it, as it provides a way to correct any interpretation mistakes.

SLIDE 6: USER NEEDS

accuracy is by far the most vital piece for success. by accuracy, we need the interface to be as close to 100% accurate as possible in both interpreting and executing commands.

the user needs to trust the interface. the situations it will be used in are ones that can be deadly if not properly handled. trust in an interfaces’ effectiveness is the major downfall of current voice interfaces and for STARFare to be successful we need the user to be able to implicitly trust it.

STARFare must be simple enough to navigate that a wide variety of users and utilize it. while this interface is made with flight crews in mind, there is always the possibility of a non-skilled user interacting with it and we must ensure that they can use it easily if need be.

SLIDE 10: USABILITY TESTING

to conduct our usability testing, we gathered two subjects and placed out initial prototype in front of them and supplies them with three tasks:

initiate red alert

send an outgoing message

perform an exterior scan.

SLIDE 11: POST-USABILITY TEST

we then timed their interactions and recorded the data. we then asked them three questions about their experience with the prototype:

is there anything that could be added to provide greater assurance in the accuracy and completion of the computer’s execution of the given command?

without prior experience using voice interfaces, are there any steps that you would have found difficult to understand, execute, or unable to use and if so, what knowledge do you have that has assisted you in easily the interface?

what might this voice interface be the most useful for as a crewman? would it also be useful in similar ways as a passenger, or would it differ and how? is there anything that you find unnecessary, or unhelpful to crewman or passengers?

SLIDE 20: UPDATED PROTOTYPE

With the updated prototype, users had three console settings which influenced the computer and user interaction.

With minimum being almost no communication and maximum being the most communication, users were able to complete all three tasks with their preference of alerts.

Users were first tested using the maximum setting, then the medium, and lastly the minimum. This was done to mimic user familiarity and practice with the system, which would increase as the console setting was decreased.

Captain uses minimum console setting for efficiency and security.

Most interactions can be done through console and if necessary, via voice authentication.

Users found that minimum console interaction was the most efficient and task completion time was reduced greatly.