NAVSEA: SEA++

Fall Demo Presentation
OUR TEAM

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Navy ships contain many systems that are in need of repair and maintenance. Right now, it is necessary for a trained expert to be flown to a ship in order to perform maintenance. Resource intensive and inefficient. Solution: use augmented reality with a HoloLens 2 in order to allow untrained users to perform maintenance.
**Original Approach**

01
Untrained user logs into HoloLens app

02
Expert connects to HoloLens user’s video stream

03
Expert walks user through system maintenance, providing augmented reality annotations for the user to see
Problems with Original Approach

**Repetition**
Similar applications have already been implemented by multiple companies.

**Environment**
Complex environment of Navy ship may make annotations less effective.

**Network**
Navy ships have limited bandwidth, may not support HoloLens video streaming.

**Verification**
Experts have no way of confirming that the HoloLens users are performing the maintenance steps accurately.
New Approach

01 Untrained user launches HoloLens app

02 User loads up CAD model and start following the preprogrammed tutorial instructions

03 The application monitors their hand movements to ensure that actions are being performed correctly
Benefits to New Approach

**Novelty**
No existing technology exists to verify that these actions are being performed correctly.

**Offline**
There is no need for Internet with a premade CAD model, which removes bandwidth requirements.

**Confidence**
Gesture tracking provides greater confidence that maintenance/repair has been performed correctly.

**Efficiency**
Experts do not need to take the time to visit the ship or go on a call. Their expertise is used to create the instructions and models.
Demo
Improvements

Maintenance Steps
Add animated steps for user to follow in order to “repair” system

Eye/Hand movement/Gesture Tracking
Track gaze, hand movement, and gestures to ensure correct action is performed at each step

Data Logs
Steps performed by the user will be sent to an expert for verification once device is online
Challenges

**EQUIPMENT:**
- Delay in getting computers and HoloLenses for development
- HoloLens requires extensive configuration

**EXPERIENCE:**
- Little to no experience with developing in Unity / for HoloLens

**PROJECT SCOPE:**
- Adjustments to project goals
- Concerns with intellectual property
THANKS!

Questions?