Intelligent Procedure Tracker
Ryan Lorica | Liqiang Mei | Jiacheng Liu | Jingzhe Chen | Anzhe Ye

Overview
NASA astronauts deal with long, complex procedures and often have to call ground control for guidance. Our project, Watchdog, aims to use AI to verify astronauts’ fidelity to standard procedure and offer suggestions during deviation. This project fuses two approaches; an event guidance language and a network of sensors (camera, NFC, IMU, Bluetooth Beacon), embedded in astronaut equipment. It identifies specific subtasks and understands the ordinal relationships between them, with the goal of a comprehensive autonomous mission guidance system.

Hardware
Nvidia Jetson TX2
The development board contains an ARMv8 Multiprocessor CPU Complex with abundant interfaces, and a 256 core Nvidia Pascal GPU to support image recognition.
PN532 Near Field Communication
Features a 10cm transmission range of signals. It uses I2C to communicate with TX2. It is used for object detection.
BNO055 Inertial Measurement Unit
Features a 9 degree of freedom accelerometer. It is used for precise motion detection via I2C.

Computer Vision

User Interface

Acknowledgements:
We want to extend our sincerest gratitude for the advice and guidance of Professor Yogananda Isukapalli, Teaching Assistants Brandon Pon and Carrie Segal, and Jessica Marquez and Richard Joyce from NASA.