


# How can technology be used to push sport forward?

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# Astronauts as athletes

- Prepare for event
- Optimize performance
- Reduce Injury Potential
- Prep the body and mind



Philosophy – train the astronaut in order to increase/maintain health prior to, during, and after the mission

# Task analysis

- Determine what is necessary to perform the task correctly

# Perform research studies to understand performance

- Ground (Lab)
- Microgravity Analog (like the field, but still the lab)
- ISS (Field)

# Studies in lab

## Advantage

- Control
- Instrumentation
- Time to collect data

## Disadvantage

- Acute
- Limitations in performance due to analog
- External Validity

# Studies in Field

## Advantage

- Real environment
- Not limited by time
- Can be repeated

## Disadvantage

- Instrumentation
- Control
- Expensive
- Case Study vs Large Sample

# Technology Used

- Motion Capture
- Force
- Metabolic
- Dynamometer
- Simulation



# Examples used at NASA

- ARED Ground Study
- ARED Flight Study
- $\text{VO}_2$  max
- Treadmill Kinematics

# Application to Athletics

- Need to find simple ways to measure meaningful performance
- Need to find methods to collect data in difficult situations
- Need to be willing to develop new methods
- Use existing methods
- Use existing instruments in new ways