

# Erik Kramer | Virtual Reality Exoskeleton (V-Rex)

## Objectives

- Design and fabricate a novel full body haptic device integrating industrial robots and custom parts
- Develop a safety-conscious controller to allow for human-robot interaction through force feedback

## Process

- **Cognizant management** of all aspects of development, fabrication, assembly, and integration
- Led support engineers and **reviewed** their work and drawings
- Created hardware designs, configurations, and drawings
- Developed **controller architecture**

## Results

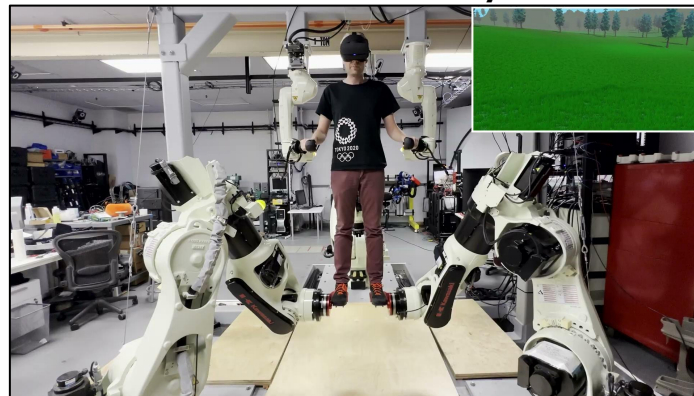
- Demonstrated design and functionality of real time safety features through experimental data
- Submitted methods and design for peer reviewed journal publication

## [Click](#) for Safety Control Feature Video Demo

Safety-Focused Admittance Control for Physical Human-Robot Interaction with Rigid Multi-Arm Serial Link Exoskeletons

Bionics Lab  
University of California, Los Angeles (UCLA)

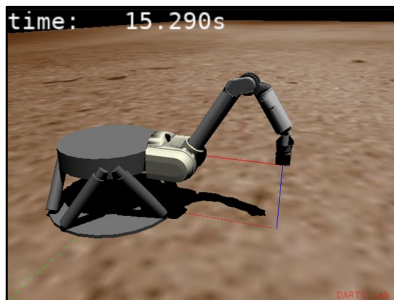
## [Click](#) for Virtual Reality Demo



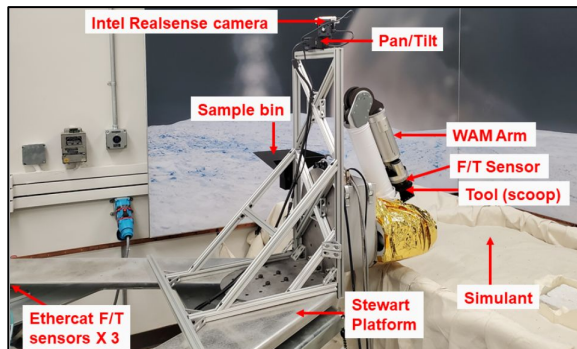
# Erik Kramer | Ocean World Lander Autonomy Testbed

**Project** → A lander and robot arm sampling testbed to evaluate the performance of user autonomy algorithms

**Tasks** → Non-earth gravity **dynamics** emulation, **motion planning** algorithms, development of user features/**sequences**



## Software Simulation and Hardware Operation



## [Click](#) for Low-Gravity Emulation Video Demo

This research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration (80NM0018D0004)

## Physical Emulation of Low-Gravity Ocean World Lander-Manipulator Dynamics on a Robotic Testbed

Erik Kramer, Ashish Goel, Anna Boettcher,  
Erica Tevere, and Hari Nayar



**Jet Propulsion Laboratory**  
California Institute of Technology

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