NASA INTERNATIONAL SPACE APPS CHALLENGE

Team: Code Creators

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Introduction

During long-duration space missions, loss of muscle mass due to weightlessness is a critical concern. The Space Muscle Simulator was developed to address this issue by providing an effective way for astronauts to maintain muscle strength and health during their missions.

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Context and Problem

In a microgravity environment, such as space, muscles are not used in the same way as on Earth, which can lead to significant muscle atrophy. Creating a simulator based on real data, such as that provided by NASA through the OSD mission -662.

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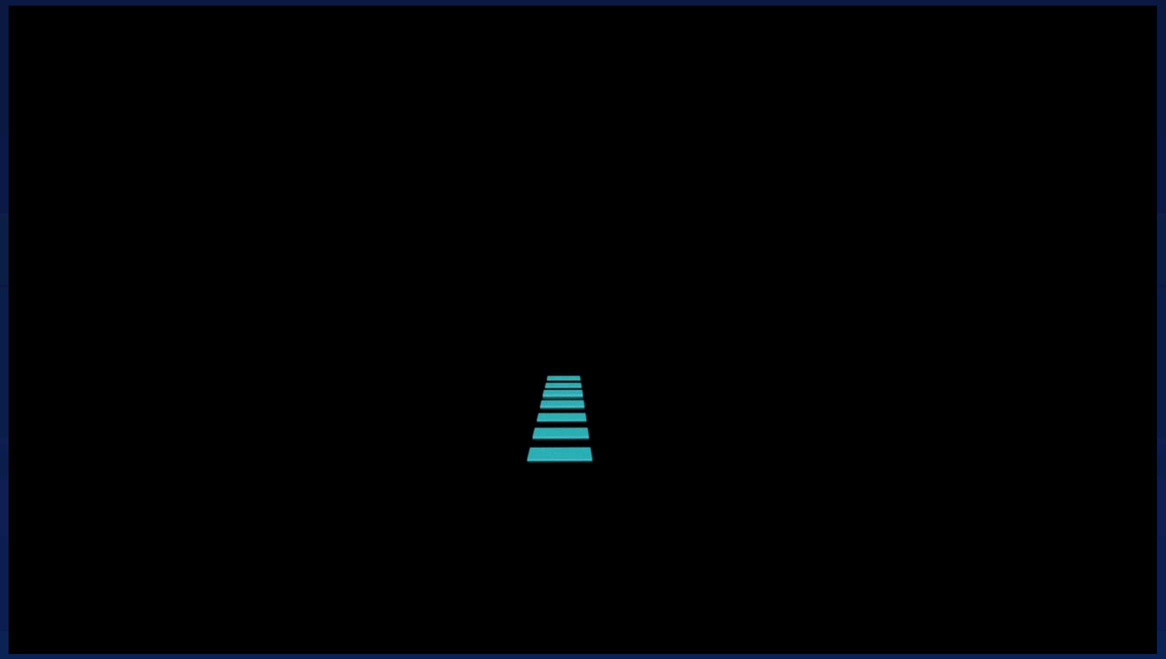
The Solution - The Muscle Simulator

How the Muscle Simulator in Space Works:
The simulator is designed to create mathematical or graphical models that represent muscular responses to the simulated microgravity environment (or the HLS model).



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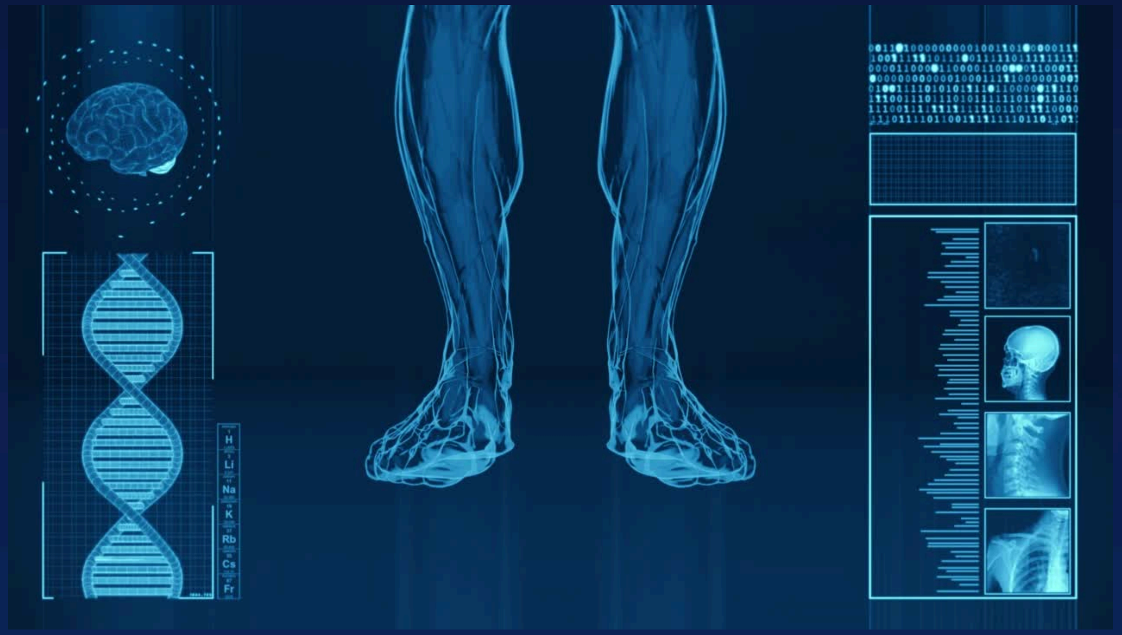
Test Results and Applications

The simulator can be useful for visualizing the effects of microgravity on muscle parameters, such as contractility, in an interactive and accessible way.

How the simulator works

To interpolate the values between the frequencies of 1 Hz and 20 Hz using a mathematical expression, a linear function will be applied to calculate the intermediate values. Linear interpolation is an efficient way to estimate values within the known range.

The formula for linear interpolation between two points (X0, Y0) and (X1, Y1).



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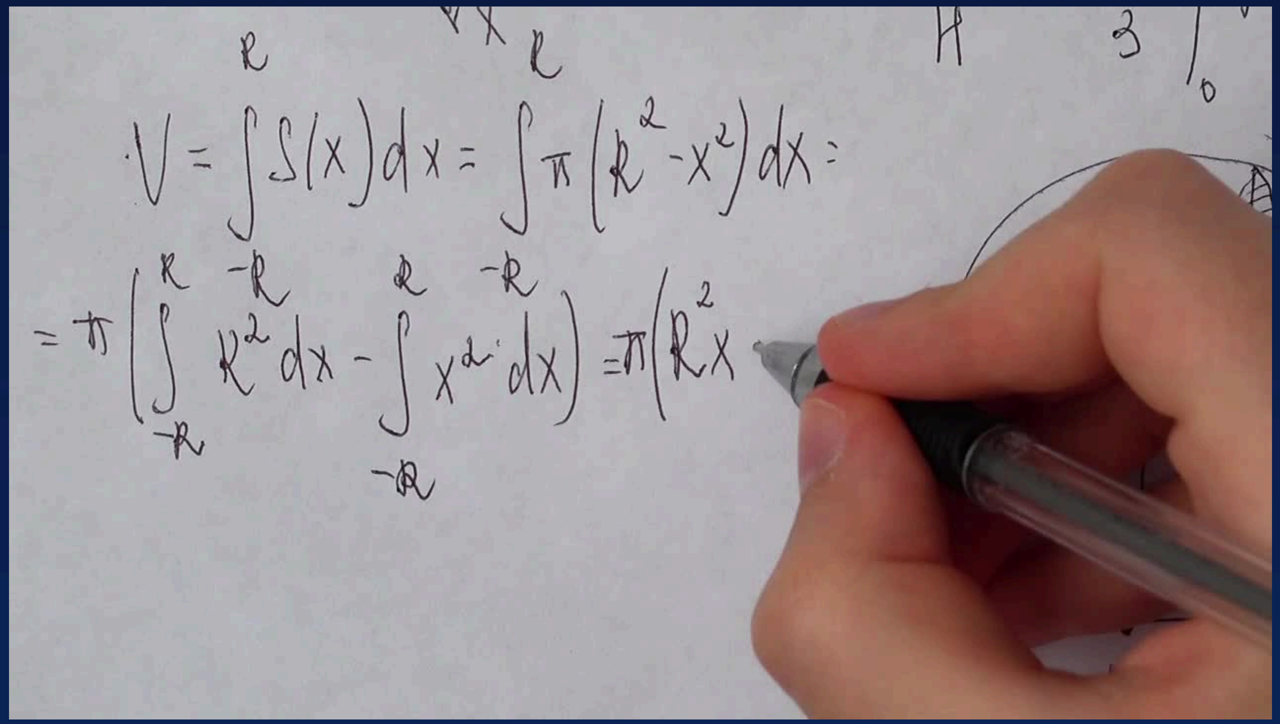
Benefits for Astronauts

The data will be provided through mathematical or graphical models that represent muscular responses to the simulated microgravity environment. Aiming at interpolation and statistical analysis techniques can be applied to fill gaps in the data and create a fluid simulation experience.



Test Results and Applications

Linear interpolation