1.4 TRANSFERENCE OF VIRTUAL REALITY BASED SENSORIMOTOR ADAPTATION TO REAL WORLD MOTION ENVIRONMENTS

Summary
The goal of the project is to develop methods for adapting individuals in one environment (on Earth) that will lead to training benefits that will carry over to other environments (e.g. space). Furthermore, our goal is to develop an adaptation training protocol that is robust in that benefits can be applied to a wide range of conditions, including zero gravity, fractional gravity, and hyper-gravity. To accomplish this we propose to use VR and sustained G centrifuge motion platforms to determine if training in VR can lead to resistance to adverse effects in real motion environments

Objectives

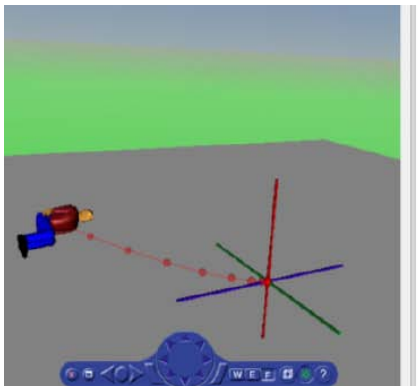
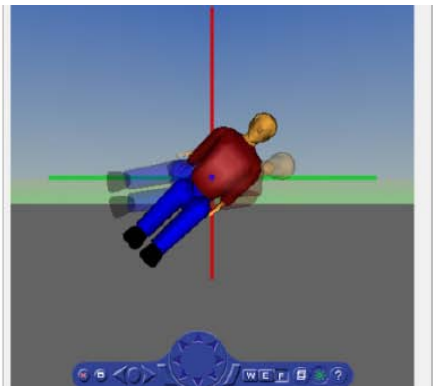
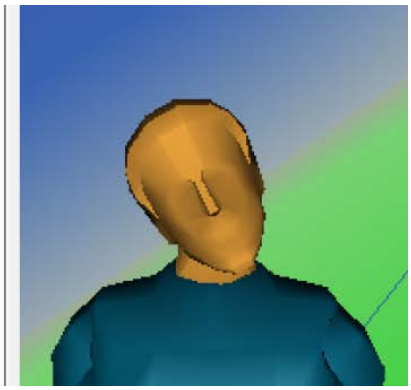
- Investigate adaptation training transference using VR and gravity transitions
- Determine if desensitization training is motion type specific
- Test the hypothesis that multiple degrees-of-freedom training will lead to resistance to adverse sensorimotor effects across a wide range of test conditions

Customer/Partner
St. Peter's College partnered with ETC

Status
Proposal submitted to National Space Biomedical Research Institute (NSBRI) in December 2011. Results of grant solicitation expected in Spring 2012 for research beginning in Fall 2012.

Future Publications
Aviation Space and Environmental Medicine
American Institute of Aeronautics and Astronautics (AIAA)

1.5 PERCEPTION MODELING FOR AIRCRAFT ACCIDENT INVESTIGATION

Summary
The goal of this effort is to develop a mathematical model of human spatial orientation perception and to determine, based on prior modeling efforts and experimental research, the general utility of the model in predicting spatial disorientation events and analyzing aircraft mishaps and accident scenarios.

Objectives

- Build, program and test past vestibular modeling efforts (i.e. Merfeld 1993, Zupan 2002, Vingerhoets 2007, Haselvanter 2001 etc.)
- Compare and validate each model's response to common experimental vestibular stimuli (i.e. Forward linear acceleration, constant velocity yaw rotation, off vertical axis rotation, post-rotational tilt, fixed and variable radius centrifugation etc.)
- Develop a GUI based analysis tool that unifies the input/output stream of the abovementioned perception models and allows simultaneous simulation and comparison between models

Customer/Partner
USARMY Air force Research Laboratory

Status
Final write up to be completed in the Spring of 2012.

Future Publications
Technical Report to the USARMY Air force Research Laboratory
American Institute of Aeronautics and Astronautics (AIAA)