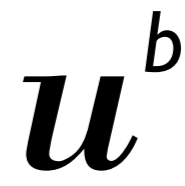


# PlatformCommander



An open source software for an easy integration of motion platforms in research laboratories

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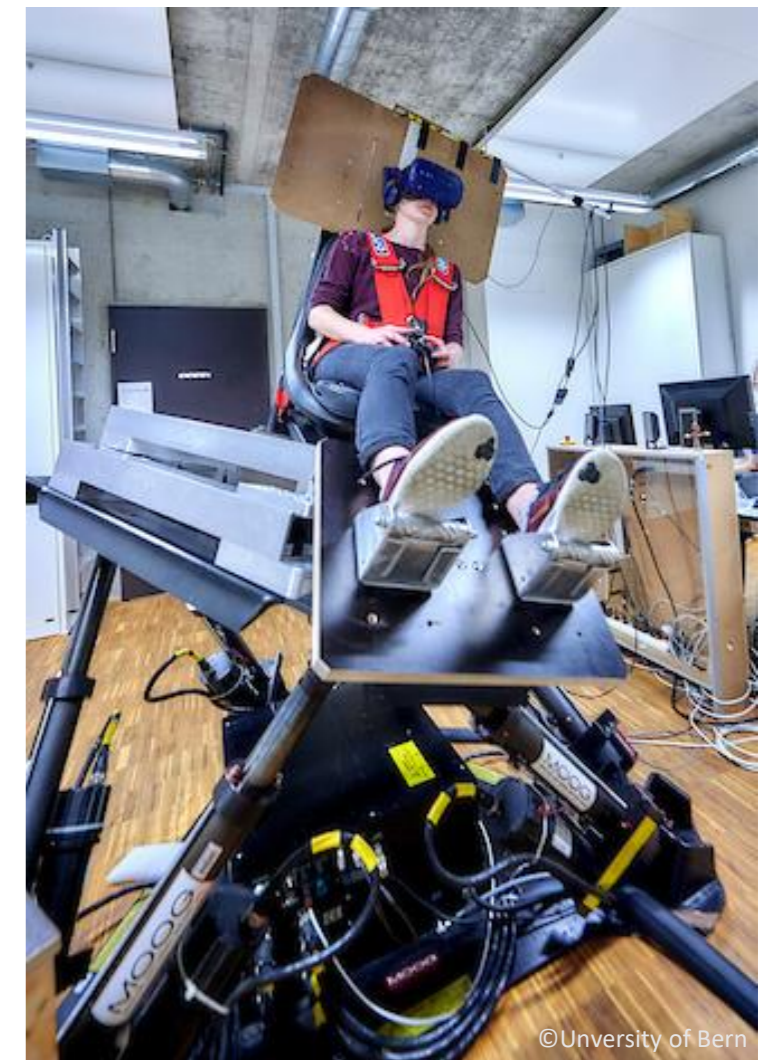
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## Background

Motion platforms are devices that allow for a selective stimulation of all five sub-components of the peripheral vestibular organ with high temporal and spatial precision. This makes motion platforms a valuable tool in clinical and basic [1] vestibular and motion research.

Despite the wide range of application in human [2,3] and primate [4] research, No standard regarding a software package for interfacing the platform and controlling its motions has emerged and most labs have developed their own code for interfacing their hexapod. These customized, closed-source solutions are in contrast to the current open-science research practice as they hinder inter-lab collaborations, comparisons, replications, or shared efforts for implementing new features.

*PlatformCommander* is an open-source software package for interfacing motion platforms which allows for rigorous and flexible experiment control. It is ideal for the synchronization of data from different sources with high temporal precision.



## Key-Features

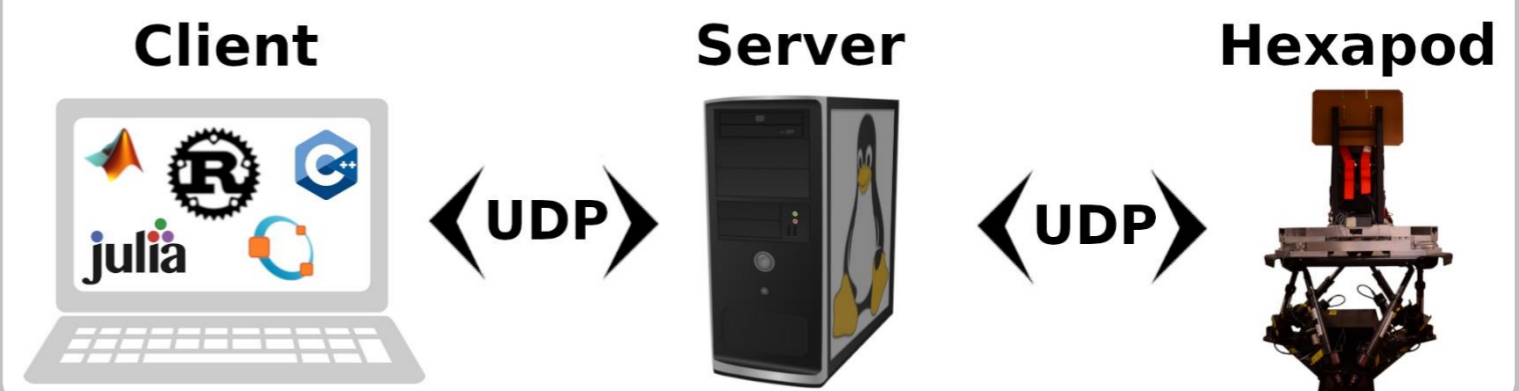
- Supported models: MOOG 6 DOF 2000E & MB-E-6DOF/12/1800KG
- Visual output to standard screens or VR-headsets (VIVE, VIVE PRO, VIVE PRO2, PIMAX 8KX)
- Complex visual sceneries through rendering of 2D, 3D objects or playback 360° videos via an Open GL engine
- Audio output via soundcard
- Control external GVS-devices (NeuroConn DC-Stimulator) via i/o-card
- Registration of buttons, mouses, joysticks, game-controllers (USB or i/o-card) input
- Data-input from accelerometers, gyroscopes (USB or i/o-card)
- Consistent & synchronized data/event logging

## Coming Soon

- Integration of \*.glTF format (in progress)
- Synchronization with EEG
- Eye-tracking (Droolon Pi1)

## Set-Up

The client-server architecture encapsulates the time critical communication with the hexapod. The server performs simulations (safety checks) of all motions before they are executed and offers a simple interface for clients. Client application can be written in any programming language. A sample client written in Julia is available online.



## Getting started

- Install the emulator on a RaspberryPi or Linux (no motion platform needed!): <https://gitlab.com/KWM-PSY/emulator>
- Look into the Manual: <https://zenodo.org/record/5743201>
- Play with our client application: [https://gitlab.com/KWM-PSY/julia\\_config](https://gitlab.com/KWM-PSY/julia_config)

Contact: [matthias.ertl@unibe.ch](mailto:matthias.ertl@unibe.ch)

Videos: <https://tube.switch.ch/channels/Zn0XXPs2tt>

## References

[1] Ertl M., Boegle R., Investigating the vestibular system using modern imaging techniques – A review on the available stimulation and imaging methods. Journal of Neuroscience Methods (2019) [2] Bremova T., Caushaj A., Ertl M., Strobl R., Böttcher N., Strupp M., MacNeilage P.R., Comparison of linear motion perception thresholds in vestibular migraine and Menieres disease. European Archives of Oto-Rhino-Laryngology (2016) [3] Ertl M., Klaus M.P., Mast F.W., Brandt T., Dieterich M., Spectral fingerprints of correct vestibular discrimination of the intensity of body accelerations. NeuroImage (2020) [4] Gu Y., Vestibular signals in primate cortex for self-motion perception. Current Opinion in Neurobiology (2018)