

## Title of the Challenge

NeuroViz Challenge: 3D Visualization of Neuroimaging Data in VR

## Overview & Objective

The goal of NeuroViz track is for participants to create innovative 3D visualizations of neuroimaging data within a virtual reality environment. This track is designed to explore the potential of VR as a tool for enhancing our understanding and interpretation of complex neurological datasets.

## Deliverables

This track is a concept design track. You are not required to make a real implementation in VR, but real implementation is always welcomed and will be awarded bonus points.

## Required submission:

- **Submission on Devpost**
  - background information and significance on the concept
  - A detailed description of your design
  - Include pictures and/or videos of your design
- **Presentation Slides**
  - A 5-10 min presentation that explains your concept design includes but not limited to:
    - § The background and significance of your design
    - § the details of your design
    - § (optional) demo of your design

**Submission Format:** Submit your deliverables digitally via the hackathon submission portal before Sunday 9:00 pm. The demos and presentations are happening at Monday 9:00am.

## Judging Criteria

Criteria		
<b>Originality and Innovation (40points)</b>	<b>Novelty of Visualization</b>	the originality and innovation of the visualization techniques used in the

	<b>Technique (20 points)</b>	project, compared against existing visualization methods.
	<b>Creative Use of VR (20 points)</b>	how well the project leverages the unique features and capabilities of virtual reality (3D interface) to enhance the visualization
<b>Neural Signal Visualization</b>	<b>Aesthetic quality (10 points)</b>	This includes the overall visual appeal, use of color, composition, and graphical elements that make the visualizations engaging and interesting.
	<b>Clear representation of signals (10 points)</b>	The accuracy with which the neuroimaging data is represented, ensuring that signals are discernible and correctly mapped in the visualization.
<b>VR-enabled 3D user interface</b>	<b>Intuitiveness of Interaction (5 points)</b>	How easy it is for users to interact with the visualization. This could cover aspects like navigation, manipulation, and exploration within the VR environment.
	<b>User empowerment</b>	The overall experience of the user when interacting with the visualization, including ease of use, understanding, and the ability to gain insights from the visualization.
Presentation (30 points)	<b>Content and Structure (15 points)</b>	Clarity and coherence of presentation structure
	<b>Completion of the project (15 points)</b>	Completeness of the project
(Bonus) VR Implementation (15 points)		

### Recommended Skills

- UI/UX design
- Signal processing
- Unity
- VR

### Recommended Hardware/Software

If you would like to implement it in VR, we recommend using Unity.

## Resources

- **Data:**
  - fMRI dataset: <https://andysbrainbook.readthedocs.io/en/latest/>
  - HCP Data: <https://db.humanconnectome.org/app/template/Login.vm?jsessionid=A7A680533F4EA3F2D72FC426132F4080>
  - EEG: <https://openneuro.org/datasets/ds003061/versions/1.1.0>
- **Tutorials:**

## Team Composition

Teams of any size is welcomed. The maximum number of team cannot exceed 5.

## Mentorship and Support

Mentors will be available during the hackathon. Check with mentor channel on slack and request mentorship if in need.

## Timeline

See the detailed schedule on website

## Prizes

Best team in this track receives Giftcards

## FAQ Section

**Q: Are there any constraints on the neuroimaging data formats?**

A: The challenge will provide specific datasets, but participants are welcome to use additional data in standard formats (e.g., NIfTI). Contact Information

A: No, you are welcome to just make conceptual designs.