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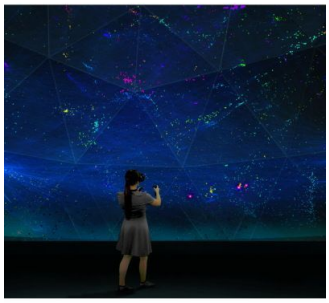
VR for Rare Diseases Identification



A team of researchers from Austria have developed an immersive virtual reality platform for visualisation of protein interactions and identification of genetic aberrations in the human body.

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While networks are efficient for complex systems visualisation and analysis, in many cases the results are limited. The human body is one such system in which thousands of proteins form a complex interaction network. A new VR platform, VRNetzer, developed at the CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences allows to intuitively explore large amounts of protein interaction data.

The platform renders about 300,000 interactions between 18,000 proteins in the human body 'readable' and thus available for further exploration of the network. The researchers identified the connection patterns between the proteins and assigned them to their biological functions. These data were then assessed against the available information on protein complexes and their association with specific clinical symptoms.

The platform features a web-based interface that does not require any VR hardware while maintaining the same functionality. It can be used by a disease expert without specialised computational knowledge.

When applying the platform to prioritisation of genomic variants of a rare disease patient, the authors propose a five-step procedure comprising data preparation; seed cluster and variant exploration; disease neighbourhood identification; detailed variant inspection; and post-processing. This would potentially allow for identification of rare genetic aberrations and be important for therapeutic interventions.

The VRNetzer source code is published on GitHub.

Source: CeMM

Image credit: Pirch et al. (2021)

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