

UnityMol tuning for better VR experiences

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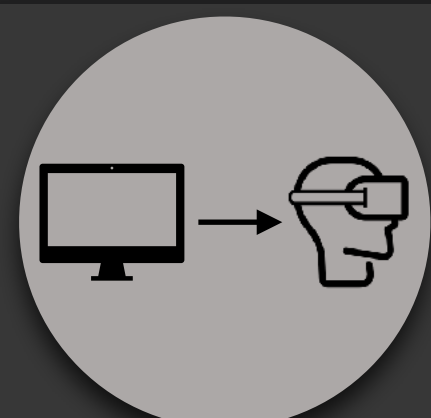


Why VR

- Depth-perception plays a key role in understanding complex molecular systems
- VR headsets are now accessible and performant solutions
- 6 degree-of-freedom controllers provide rich interaction



Why molecular visualization in VR




Necessary **software adaptations** to transform a tool from desktop to VR:

- Prohibit camera movements, only the objects/molecules are translated/rotated
- Add 3D context and visual landmarks to mitigate cyber-sickness
- Adapt interaction metaphors, use richness of VR controllers: translations + rotations + shortcuts for common actions: selections / annotations / representations ...
- Adapt UI, HMDs resolution is still limiting: UI design & interaction has to compensate for user imprecision

Desktop To VR

Concrete VR use case @LBT

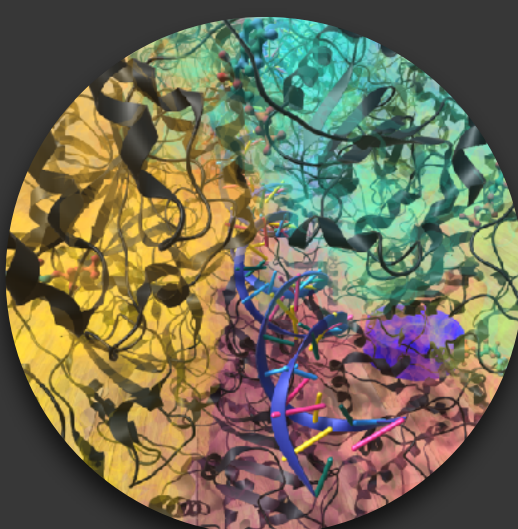
Building a water channel based on 6 monomers

- Desktop is hard because 2D mouse/keyboard interaction 
- UnityMol docking mode collisions = helping assembling monomers
- Method: load 6 monomers | enable docking mode | assemble the monomers | export PDB file

Molecular exploration

Dense molecular scenes + MD trajectory

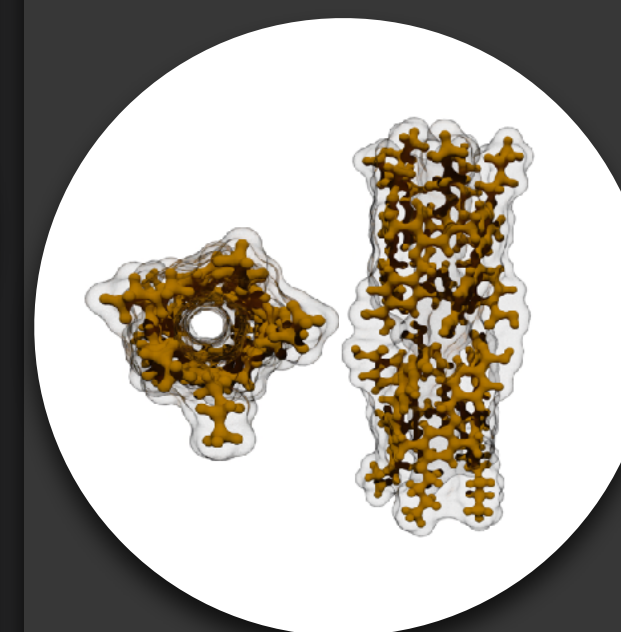
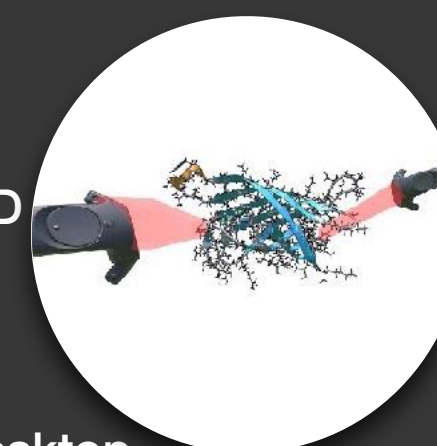
- Depth-Perception vs 2D screens
- Rich interaction helps exploration
- Users can physically change their POV



Interactive Molecular Dynamics (IMD)

Rich interaction devices are mandatory during IMD sessions

- Selecting atoms + apply targeted force easier in 3D
- Haptic feedback helps perceive applied forces
- Specific devices for bimanual interaction in desktop



x 6 =

