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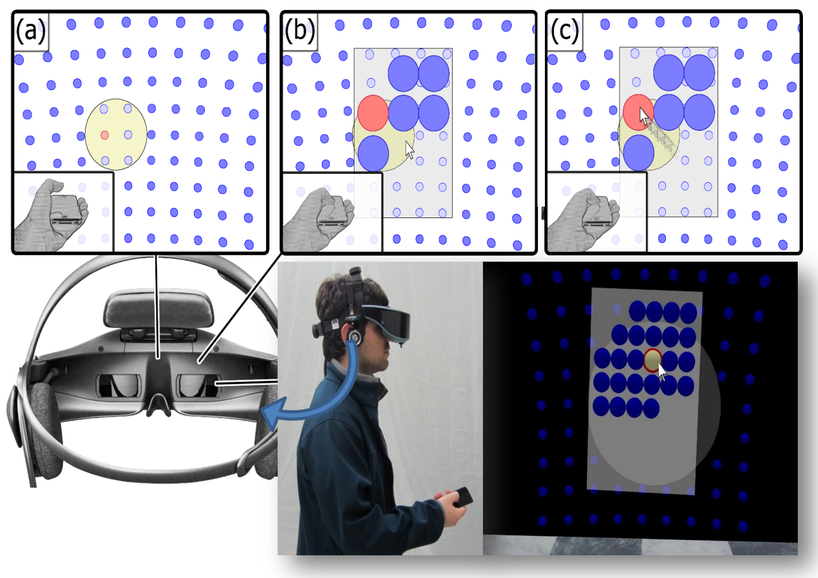
3D Interaction with Cluttered Datasets

DCanvas

Disambiguation canvas is a technique for selection by progressive refinement using a smartphone and consists of two steps:

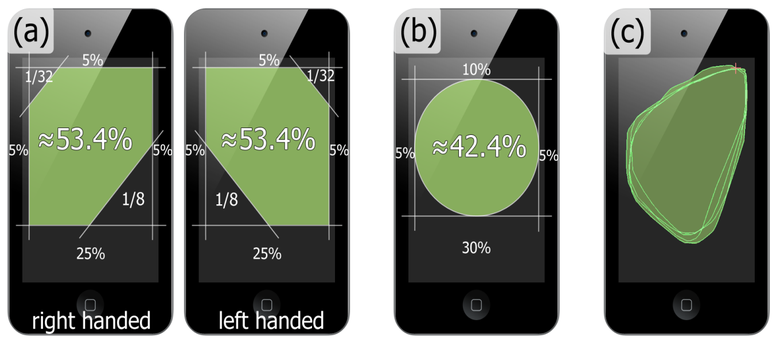
1. The user chooses a subset of objects through the orientation sensors of the device and a volume-casting pointing technique.
2. The desired object is disambiguated from this subset using the smartphone touchscreen.

Technique Walkthrough

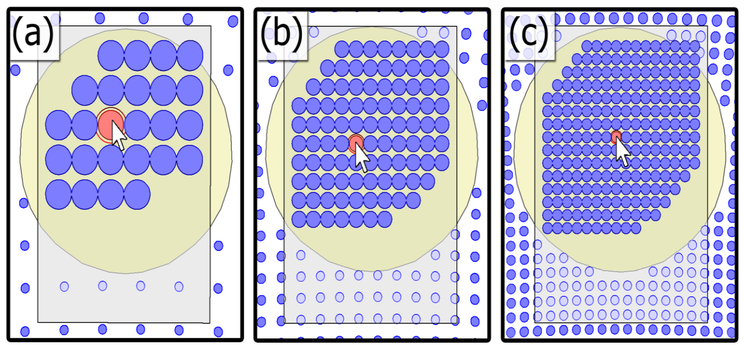


The user points to the region where the desired object is located (a); starting a touch rearrange the subset of objects pointed (b); the user slides his thumb to point out the desired object and selects it with a touch take off gesture (c).

Design Details



Users may be unable to reach all the touchscreen. Thus, we defined two standard area layouts (a and b) and a configurable on (c).



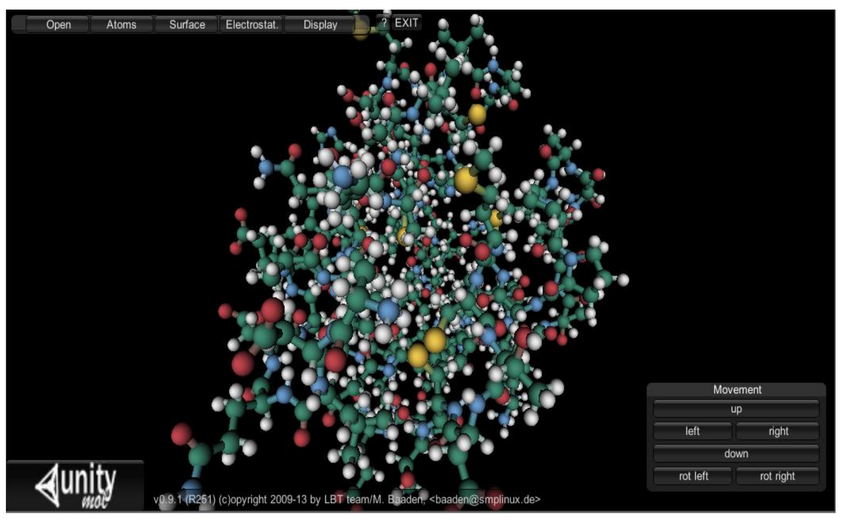
Difficulty of selection is proportional to the amount of objects in the second step: 25 (a), 97 (b) or 224 (c) objects.

Unitymol

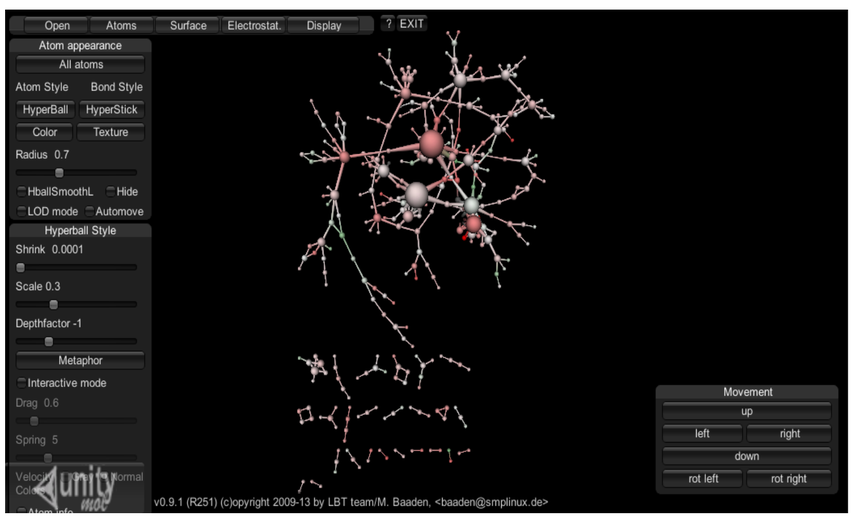
Unitymol* is an open source molecular and biological network viewer using Unity3D. The viewer allows access to the Worldwide Protein Data Bank that contains over 60,000 high-resolution protein structures, and focus on molecular visualization.

* http://www.baaden.ibpc.fr/umol/

Molecule



Biological Network



Spheres and cubes are used to render atoms (for molecular structures) or nodes (for networks); links between them are rendered using lines.

DCanvas vs Unitymol

Unitymol, besides the viewing allows interaction with the molecules. It is possible to translate and rotate molecules with six DOFs to ease visualization. Integrating the disambiguation canvas with Unitymol has the potencial to provide a more intuitive interaction with molecules.

Three-dimensional gestures captured by sensors in the smartphone combined with the two-levels interaction is expected to provide better user performance and experience in manipulating molecules.

In this work, we plan to iteratively evaluate and adapt the disambiguation canvas design to fit the molecule manipulation task. The resulting technique and an analysis of its use will be presented in a near future.

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