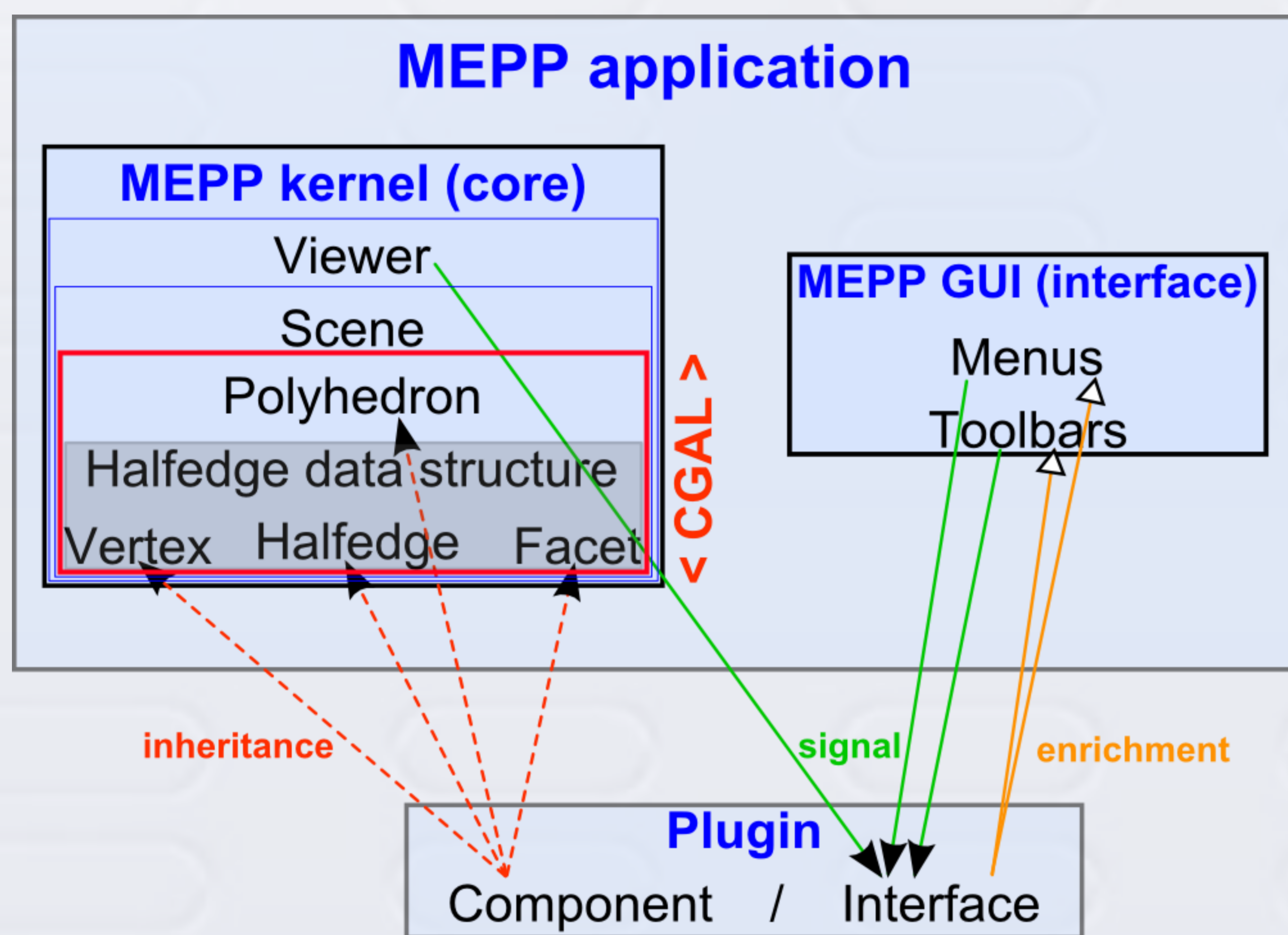


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## Main features

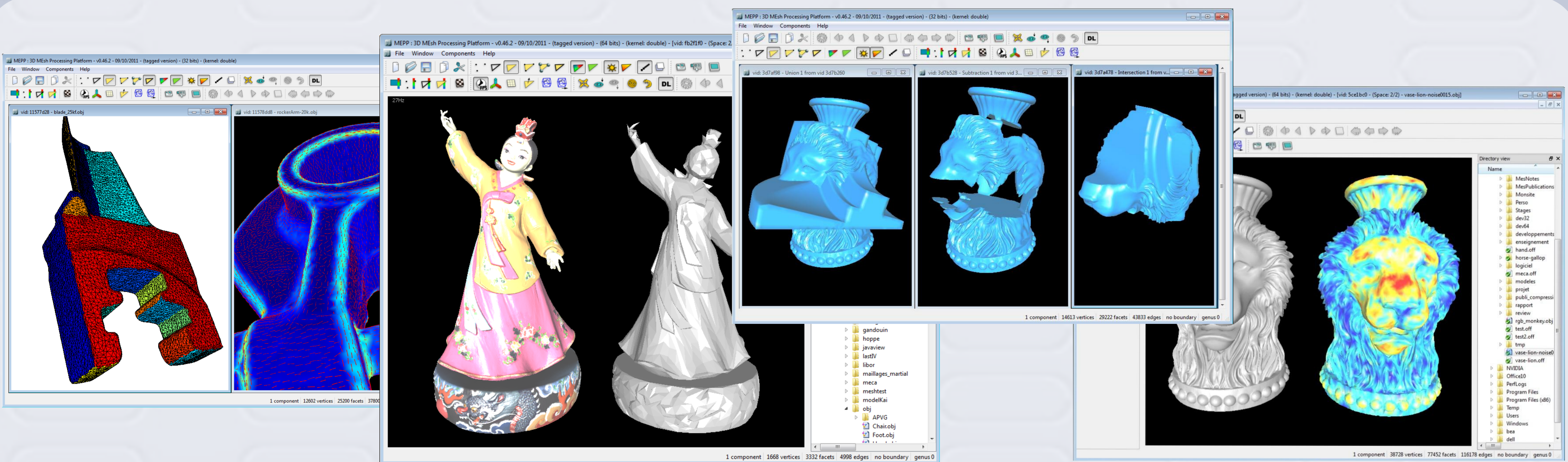
- **Open source platform** for 3D mesh processing, available on Windows, Linux and Mac OS X.
- Based on the **class Polyhedron of CGAL**, and also on Qt, libQGLViewer, OpenGL, Boost and FFmpeg.
- Supports both **static and dynamic 3D meshes** (formats OBJ, OFF, PLY, SMF and X3D).
- A large set of processing tools is already available (simplification, subdivision, segmentation, compression, watermarking, Boolean operation, perceptual metrics).
- Allows a **quick start for both users and developers** by providing highly detailed tutorials and simple integration mechanisms.
- **Modular architecture** where components are implemented as dynamic plugins.

## Architecture



## Components

- **Basic processings**  
 Basic mesh manipulation, subdivision algorithms, simplification algorithms.
- **Curvature and segmentation**  
 Normal cycle curvature [CM03], geodesic neighborhood, Variational shape segmentation [CAD04].
- **Boolean operation**  
 Fast and exact Boolean operations algorithm [LBD10] between 3D meshes: union, intersection, difference (two 80K vert. meshes in about 2.5 seconds).
- **Perceptual quality metrics**  
 Recent metric from [Lav11]; it computes a score that predicts the perceived distortion between two objects, as well as a distortion map.
- **Compression and watermarking**  
 Recent progressive compression algorithm [LLD12] applying for colored meshes, and a join watermarking scheme [LDL11].
- **Minkowski sum**  
 Exact Minkowski sum of convex polyhedra [BDD09].



[BDD09] Barki, H., Denis, F., and Dupont, F. (2009). Contributing vertices-based Minkowski sum computation of convex polyhedra. *Computer-Aided Design*, 41(7):525–538.

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[CM03] Cohen-Steiner, D. and Morvan, J. (2003). Restricted Delaunay triangulations and normal cycle. *ACM Sympos. Comput. Geom.*

[Lav11] Lavoué, G. (2011). A Multiscale Metric for 3D Mesh Visual Quality Assessment. *Computer Graphics Forum*, 30(5):1427–1437.

[LBD10] Leconte, C., Barki, H., and Dupont, F. (2010). Exact and Efficient Booleans for Polyhedra. Technical report Liris-4883.

[LDL11] Lee, H., Dikici, C., Lavoué, G., and Dupont, F. (2011). Joint reversible watermarking and progressive compression of 3D meshes. *The Visual Computer*, 27(6-8):781–792.

[LLD12] Lee, H., Lavoué, G., and Dupont, F. (2011b). Rate distortion optimization for progressive compression of 3D mesh with color attributes. *The Visual Computer*, 28(2):137-153.