Supporting Information

A versatile and efficient voxelization-based meshing algorithm of multiple phases

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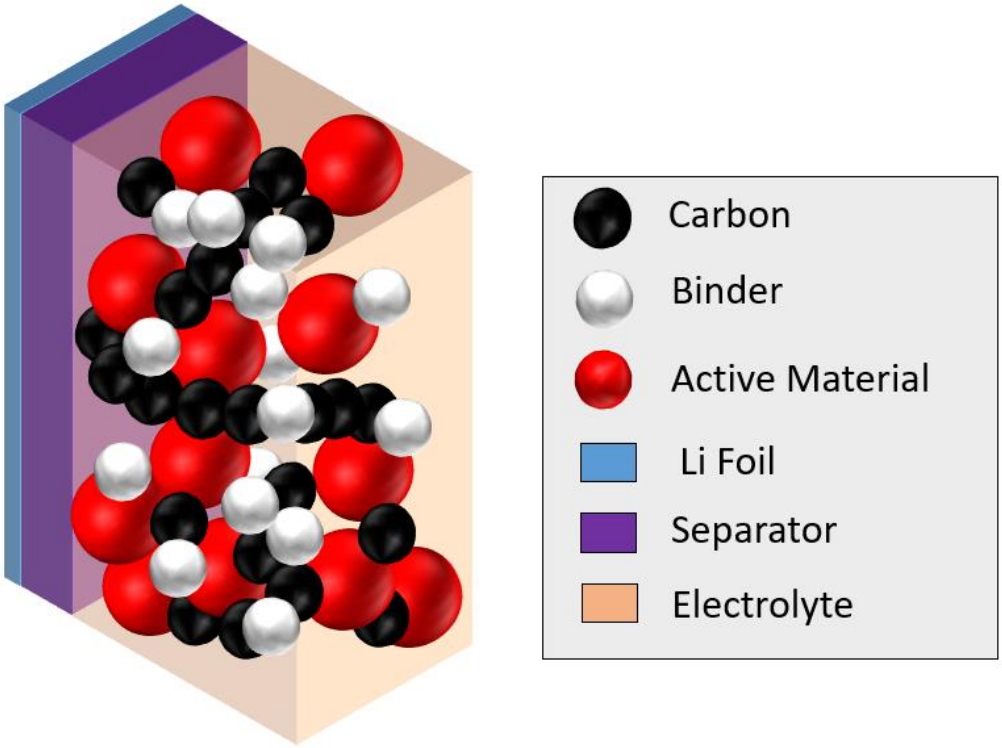

Figure S1. Schematic representation of a LIB.

The Figure S1 highlights the complexity of a LIB cell. It consists in a Li foil as negative electrode, a separator to prevent any shortcut and a positive electrode. At both sides, there are metallic current collectors, which are not represented in the figure. The positive electrode is composed of active material, which is the host for the lithium (de)intercalation. Then the carbon particles provide a transport network for the electrons and the electrolyte allows the Li^+ transport between the electrodes. Finally, the binder ensures the physical integrity of the structure.

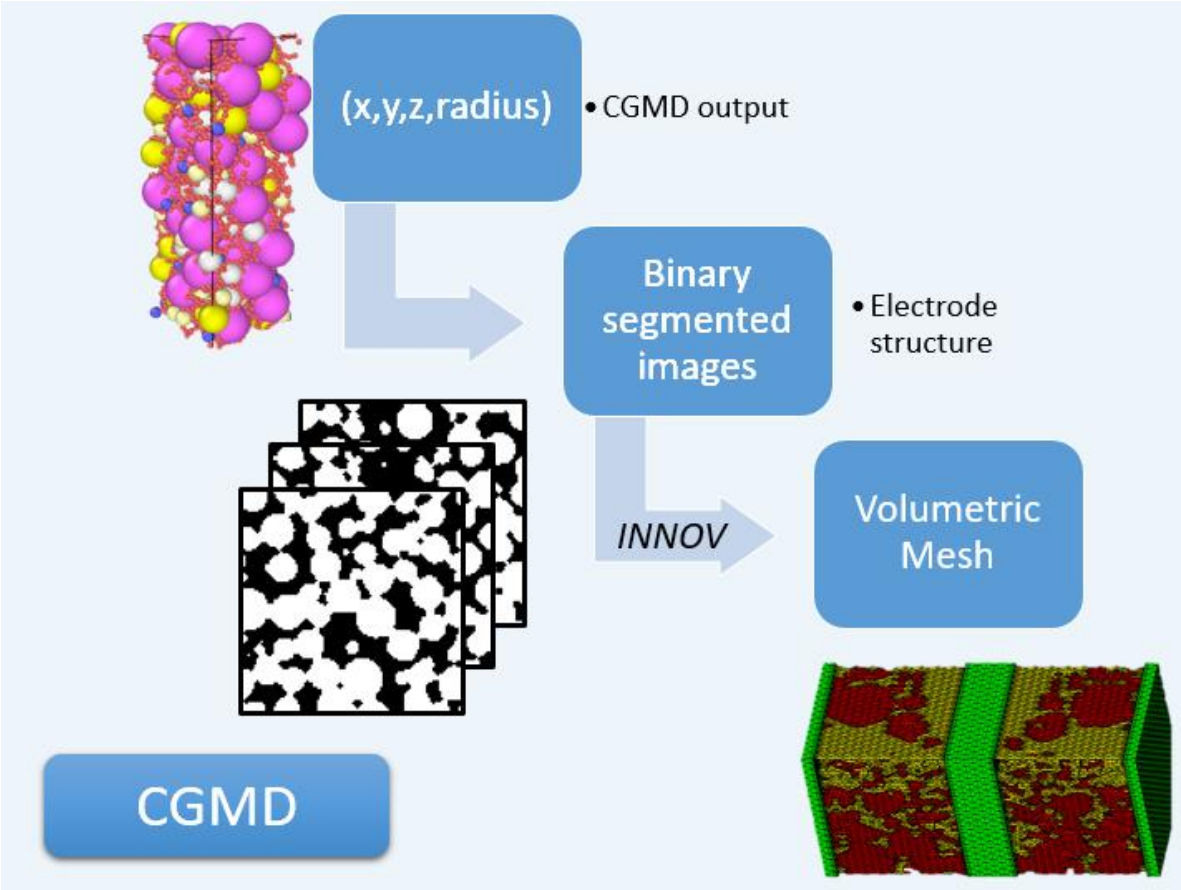

Figure S2. Meshing process of meshing from CGMD structure to the volumetric mesh.

Figure S2 illustrates the meshing process of a CGMD structure generated with LAMMPS. The output of the LAMMPS simulation is the coordinates of the centers and radii for each particle. A MATLAB-based function was created to convert this output into a stack of binary images. Then the INNOV algorithm generates the multi-phase volumetric mesh of the input structure.

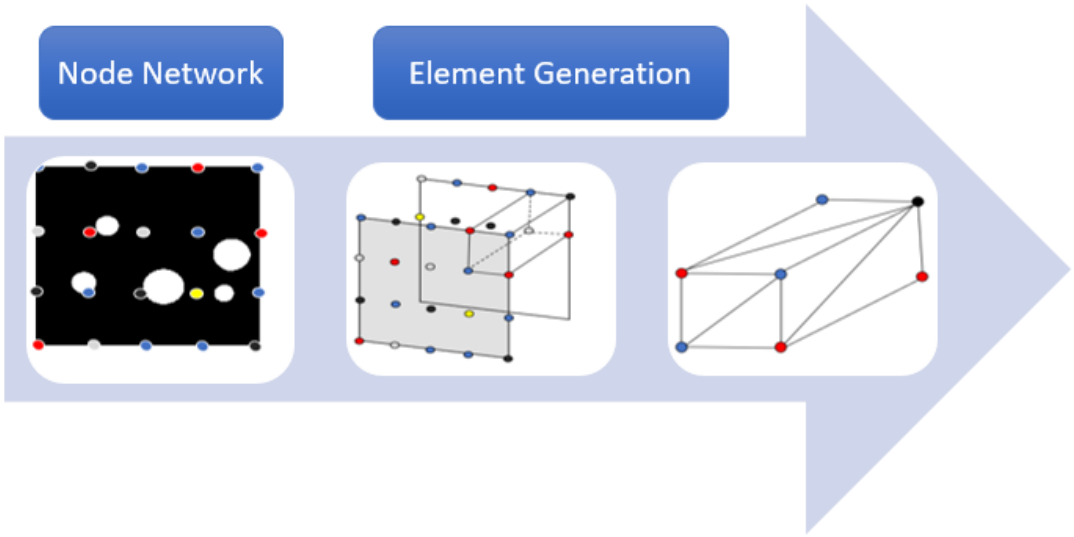

Figure S3. INNOV process to generate elements from stack of images.

Figure S3 highlights how voxelization divides the structure. At first, each pixel is associated to a node. Then by linking nodes of two neighboring slices, INNOV creates voxels. These voxels are finally divided into tetrahedrons.