u-signal3D Package Description

The u-signal3D package is primarily designed to quantitatively analyze the spatial scales of molecular organization at 3D cell surface. We applied the Laplace-Beltrami operator (LBO) to a triangle mesh, represented the cell shape, to generate frequency-based hierarchical functions as a basis function, then decompose cell surface signaling across spatial scales created within this basis set. The u-signal3D framework is a series of MATLAB functions bundled into a user-friendly interface.

It is associated with the paper, **Cellular harmonics for the morphology-invariant analysis of molecular organization at the cell surface**, *Nature Computational Science*, 2023, written by Hanieh Mazloom-Farsibaf, Qiongjing Zou, Rebecca Hsieh, Gaudenz Danuser, Meghan Driscoll.