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A 3D interpolation algorithm for layered tilted geological formations using an adapted inverse distance weighting approach

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Abstract We present an algorithm for the 3D interpolation of layered tilted hydro-geological structures from point data. The method uses profile information and interpretations of the geological layering to interpolate discrete or continuous values in a meshed grid consisting of arbitrary element types. The user has the opportunity to tweak several options of the algorithm depending on the given application's circumstances (e.g. data availability and reliability) and additional soft information of the geology. The interpolation algorithm is implemented in Qt and can be used as a pre-processing tool for mesh-based numerical methods (i.e. finite difference method, finite element method, finite volume method).

Key words interpolation; 3D; pre-processing; inverse distance weighting; tilted; layered