

Deep Weighted Consensus (DWC)

Dense correspondence confidence maps for 3D shape registration

Dvir Ginzburg
Tel Aviv university

dvirginzburg@mail.tau.ac.il

Dan Raviv
Tel Aviv University

darav@tauex.tau.ac.il

We present a new paradigm for rigid alignment between point clouds based on learnable weighted consensus which is robust to noise as well as the full spectrum of the rotation group. Current models work well for constrained orientations and limited noise levels. However, real-world tasks require us to deal with large rotations as well as outliers and all known models fail to deliver. Here we present a different direction. We claim that we can align point clouds out of sampled matched points according to confidence level derived from a dense, soft alignment map. The pipeline is differentiable, and converges under large rotations in the full spectrum of $SO(3)$, even with high noise levels. We compared the network to recently presented methods such as DCP, PointNetLK, RPM-Net, PRnet, and axiomatic methods such as ICP and Go-ICP. We report a fundamental boost in performance.

