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3D Gaussian Splatting

Roy Amoyal, Ben Gurion University of the Negev

We present Gaussian Splatting Alignment (GSA), a novel method for aligning two independent 3D Gaussian Splatting (3DGS) models via a similarity transformation (rotation, translation, and scale), even when they are of different objects in the same category (e.g., different cars). In contrast, existing methods can only align 3DGS models of the same object (e.g., the same car) and often must be given true scale as input, while we estimate it successfully. GSA leverages viewpoint-guided spherical map features to obtain robust correspondences and introduces a two-step optimization framework that aligns 3DGS models while keeping them fixed. First, we apply an iterative feature-guided absolute orientation solver as our coarse registration, which is robust to poor initialization (e.g., 180 degrees misalignment or a 10x scale gap). Next, we use a fine registration step that enforces multi-view feature consistency, inspired by inverse radiance-field formulations. The first step already achieves state-of-the-art performance, and the second further improves results. In the same-object case, GSA outperforms prior works, often by a large margin, even when the other methods are given the true scale. In the harder case of different objects in the same category, GSA vastly surpasses them, providing the first effective solution for category-level 3DGS registration and unlocking new applications. Project webpage: https://bgu-cs-vil.github.io/GSA-project/