Abstract: Contact Surface Graph: a data structure for efficiently finding contact-rich poses of virtual characters

Changgu Kang, Sukwon Lee, and Sung-Hee Lee[*]
Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea
{ckang, sukwonlee, shl}@gist.ac.kr

Abstract

Rapidly advancing 3D scanning technologies are enabling ready creation of augmented reality (AR) space from an arbitrary physical space. However, it remains a challenging task for an autonomous virtual character to create natural motion in the AR space purely based on the geometric information acquired by 3D scanners. Such scanners typically output just the point cloud data of the environment. Aiming to create contact-rich poses for virtual characters adaptive to the arbitrary shapes of objects, we present a graph-based data structure (Contact Surface Graph) that structuralizes the point cloud data. It also pre-computes important geometric object information related to generating virtual character poses. The CS graph supports building contact poses by matching a node, which represents an object's contact surface to a virtual character's body segment in real time. We tested our framework with a set of indoor objects including chairs and tables.

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