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Spatially Mapping Smart Objects within AR Scenes

This Augmented Reality system rapidly estimates the 3D location of distributed smart devices, enabling accurate and dynamic interactions within a smart environment.

As a novel interface which bridges the real and the digital, Augmented Reality (AR) has become a promising surrogate for interacting with proliferating smart things. Users are exposed to the functionalities of several devices to make up a smart environment. The key part of interacting with a smart environment in mobile AR is mapping of the smart objects globally, i.e., knowing where the smart things are located in the AR scene. Simple scene augmentation, multi-view object detection, and pose estimation have been achieved by detecting the objects in a camera's local view. But, there has been little to no direction in enabling AR interaction with the surrounding smart environment as a whole ecology.

Researchers at Purdue University have developed an AR system called Scenariot, a fast estimation of the 3D locations of smart things that exploits the spatial relationships for location aware interactions. Using the system, a user can survey the surrounding environment while moving and instantly approximate the location of the IoT devices with an accuracy of ~0.4 meters even if a device is not in the camera's local field of view.

Advantages:

-Estimate 3D locations of distributed smart things

-Rapidly map and interact with smart things in AR scenes

-Accuracy of ~0.4m

Potential Applications:

-Augmented Reality

-IoT Devices

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Category

Robotics & Automation/Perception & Sensing

Artificial Intelligence & Machine Learning/3D Optical Imaging & Industrial Metrology

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View online

-Applications demonstrating usage of proposed technology

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Intellectual Property:

Provisional-Patent, 2018-03-02, United States

PCT-Patent, 2019-02-27, WO

NATL-Patent, 2020-09-02, United States

CON-Patent, 2022-09-20, United States

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