Visible Light based Activity Sensing using Ceiling Photosensors

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Abstract

This work explores the feasibility of tracking motion and activities of humans using visible light. Shadows created by casting visible light on humans and objects are sensed using sensors that are embedded along with the light sources. Existing Visible Light Sensing (VLS) techniques require either light sensors deployed on the floor or a person carrying a device. Our approach seeks to measure light reflected off the floor to achieve an entirely device-free and light-source based system. Our system uses a sensitive standard difference measurement technique to detect small voltage changes, together with a time division flickering scheme to differentiate between light nodes. We evaluate the feasibility of our system in detecting simple activities, and show that it can detect door opening events at 12% Equal Error Rate

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