筑波大学
University of Tsukuba

EME International Seminar Series

4D measuring of the soil's surface by integrated 2D Lidar from an excavator

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Abstract:

Excavators are widely used throughout the world at earth-moving sites and are expected to continue to play an important part in the construction sector in the future—whether in hydraulic or electric form. Increased automation levels are needed for multiple reasons, for example, digging operations in places too dangerous for humans or those that are too time-consuming, such as deep mines and so on. In addition, construction materials and related management, handling, and storage provisions account for a large part of construction expenses. Increasing automation levels will require the integration of a large number of diverse sensors, sophisticated algorithms, and powerful data integration software. The 2D profilometer developed for this application field is based on the pulsed laser time-of-flight (TOF) technique. In our system, a profilometer is attached to the excavator's arm, making the approach quite unique. Our research utilizes the natural movement of the excavator boom above the object to produce a 3D image with a solid-state 2D profilometer. Our research has for example determined the volume of soil stockpiles and road layer thicknesses.

Monday, 27, February 2023 15:00 – 16:00 (JST) 3E301 and Teams (hybrid)
(Team code: z2y60pz)