

3. Development of Automated Excavation System Based on Tiltrotator-Equipped Hydraulic Excavator - System Overview and Verification -

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To improve productivity, the construction industry in recent years has energetically pursued the development and implementation of construction automation. We have developed an automated excavation system using a hydraulic excavator equipped with a tiltrotator, which allows for efficient construction.

This system creates an excavation plan by generating an excavation trajectory that leverages the tiltrotator's features based on the planned excavation shape. Based on this plan, the system executes automated excavation via remote control.

The software for this system utilizes the Open Platform for Earthwork with Robotics and Autonomy (OPERA), an autonomous construction technology platform developed by Japan's Public Works Research Institute (PWRI). We undertook demonstrations for three varying planned excavation shapes, including varying slope arrangements, and confirmed that the system is capable of performing automated excavation almost exactly as designed.

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