Shield construction using AI to improve efficiency and quality - "AI Transform Shield

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1. Outline

Maintaining the position and posture of the shield machine against the natural ground is important in managing the digging with shield tunneling method. Even though all excavation data is mechanically accumulated, it is difficult for human operators to acknowledge all the data to manage excavation according to the quality of the soil. This technology utilizes artificial intelligence (AI) to measure the posture of the shield machine and uses past digging data to automatically change the posture of the shield machine when going forward.

2. Features

The AI, which accumulates shield tunneling data during and after excavation, searches for past tunneling data that has the most similar composition of the soil during excavation. The AI extracts items such as face pressure, cutter torque, and corresponding jack speed when the shield machine was excavating smoothly in the past cases. Based on the extracted data and the automatic surveying data, the system continuously presents the best jacking pattern that has the smallest deviation from the reference line.

3. Effectiveness

The AI further evolves by learning from a huge amount of teaching data accumulated from the shield tunneling data during and after construction. This helps improve the efficiency and quality of construction.

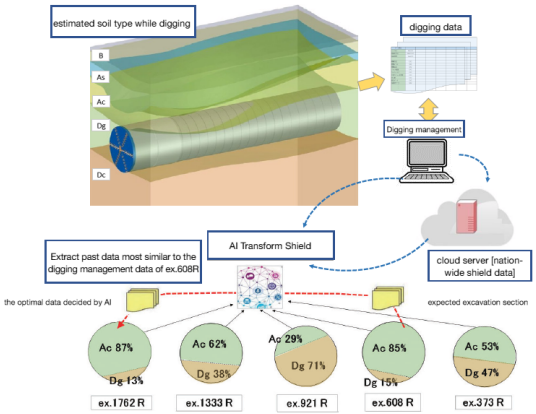

Fig. 1

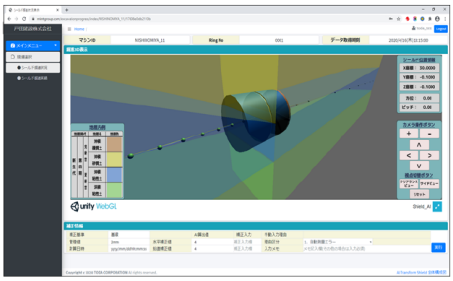

Fig. 2