## **Face Condition Viewer**

Hironori SATO ► Takenaka Civil Engineering & Construction Co., Ltd.

Face Condition Viewer is an alarm system that alerts the danger of collapse of the tunnel face by utilizing ICT to predict rock falls, collapse, and cave in of a tunnel during construction. Technology used for this system obtains the real-time movement of the tunnel face pushing forward. By comparing to conventional observation of movement of the tunnel face, the system can predict rock falls, collapse, and cave in of a tunnel earlier before it happens. Alerts are projected on the cutting face, as a direct, visual alert. At the same time, Augmented Reality (AR) technology is used to superimpose the dangerousness of collapse of the tunnel face on the images of the tunnel face on wearable devices and other screens. Three-degree color schemes and circle sizes are used on the tunnel face images, where the tunnel face is split into meshed blocks. The system allows to detect tunnel face movement pushing forward and display them on wearable devices and other screens, which was difficult to recognize by manual inspection. The system is used along with workers monitoring the tunnel face manually to alert workers near the tunnel face to evacuate or carefulness, which is helpful in increasing the safety of workers in case of rock falls, collapse, and cave in of tunnels.

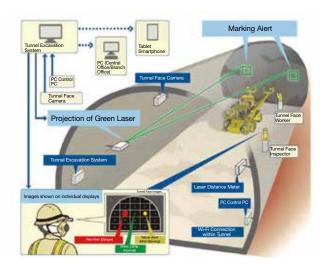


Fig. Summary of Face Condition Viewer