

센서오류가 잦은 harsh process에서 VAE- ResNet 센서자기보정기술기반 지속가능 모니터링 연구

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Automatic fault detection and diagnosis of wastewater treatment plants (WWTPs) sensors are crucial for energy conservation and environmental protection. Given the dynamic and nonlinear characteristics of WWTP data, the built diagnosis models are inefficient and ignore potential useful features in the offline modeling phase, leading to many false alarms and imperfect detectability. This study proposes novel intelligent sensor self-validation framework based on newly designed variational deep residual network model (VAE-ResNet), which can automatically extract complex features from WWTP data . This sensor self-validation framework consists of fault detection, fault isolation, and faulty data reconstruction. The VAE- ResNet method was the most effective to detect ($DR_{SPE}=100\%$) and reconstruct faulty WWTP sensors (RMSE=2.53-4.17). **Acknowledgments:** This work was supported by the National Research Foundation (NRF) grant funded by the Korean government (MSIT) (No. NRF-2017R1E1A1A03070713), Korea Ministry of Environment (MOE) as Graduate School specialized in Climate Change, and Korea Ministry of Environment as "Prospective green technology innovation project (2020003160009)".