

## **Generative data for defect augmentation and its effectiveness**

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In industry, Automated Visual Inspection (AVI) is vital for quality control in modern production lines. Collecting sufficient data for training neural networks is crucial to acquiring a fast, effective, and robust AVI system. However, data collection is typically expensive and time-consuming, especially for defective data.

Recently, the rapidly advanced generative models have offered a way to produce high-quality photo-realistic synthetic data efficiently. Nevertheless, adapting generative models to limited data regimes is also challenging due to the data-hunger nature of generative models. Moreover, how effective is the synthetic data from these models in the downstream application?

This talk introduces a GAN-based generative model that aims to produce diverse surface defects despite having limited (e.g., 20~200 samples) data. Additionally, we will discuss our research on synthetic data generated by deep generative models such as GANs and diffusion models. We will highlight their current limitations in downstream tasks and suggest ways to overcome them.