

Artificial intelligence and machine vision Overview

Visual inspections of safety-critical systems are crucial in reducing the risk of equipment failures, downtime, and loss of life. This non-destructive testing (NDT) method uses a portable video borescope to inspect difficult-to-access areas with ease, minimum time, and cost. With the advancement in computer vision and image processing, Baker Hughes developed innovative RVI solutions, such as Real3D™, to ensure measurement accuracy, and TrueSight™, for superior image quality. Although these video borescope solutions from Baker Hughes provide high definition (HD) image quality with 3D characterization of defects, such as cracks, pits, dents, corrosion, defect identification still requires human expertise, which is challenging, time-consuming, and subject to human error. The overall research objective of this collaborative research proposal, between Baker Hughes and OSU, is to develop an AI-driven video borescope by introducing a graph network-enabled meta-learning framework. The key idea is to interpolate the relations among the labeled and unlabeled datasets from multiple modalities via a novel graph neural network to perform meta-learning to achieve high generalization capability.