

## **Cyclegan For Generating Undamaged-To-Damaged Vibration Data For Structural Health Monitoring**

**Furkan LULECI, Necati CATBAS**

*ABSTRACT:* Vibration-based Structural Damage Diagnostics (SDD) of civil structures is very prominent for structural safety. However, it is important to note that collecting damaged and undamaged cases is a difficult and expensive task during the Structural Health Monitoring (SHM) of civil structures. For that, in this paper, Cycle-Consistent Generative Adversarial Networks (CycleGAN) is employed on unpaired 1-D vibration datasets to learn the mapping between two different vibration dataset domains, undamaged and damaged. With this approach, dynamic response domain of existing structures can be translated to undamaged or damaged which enables superior SDD.