

Automated Extraction and Classification of MFL Signals Obtained from Natural Gas Pipeline Inspection

ABSTRACT:

Magnetic flux leakage (MFL) methods are widely employed for the nondestructive evaluation (NDE) of gas pipelines. The inspection tool would typically collect a vast amount of data (of the order of 1Tbyte). Currently, the data is analyzed by trained analysts. The manual analysis of the large amount of data produced during the inspection can be both time-consuming and expensive. Consequently there is considerable interest in the industry to automate the analysis procedure. Key advantages of the automation process include improvement in the accuracy, speed and consistency of interpretation. The proposed research presents a novel approach to the tasks of analyzing, segmenting and classifying the MFL data from gas pipelines. The analysis will be performed in various stages. The first step in the process involves the determination of the size and location of all the MFL indications due to defects and other pipeline artifacts in the data. A list of statistical and physical characteristics of each indication identified in the signal extraction algorithm will be compiled. These characteristics, called the signal features, will be applied to a statistical or artificial neural network, which will classify the signals.

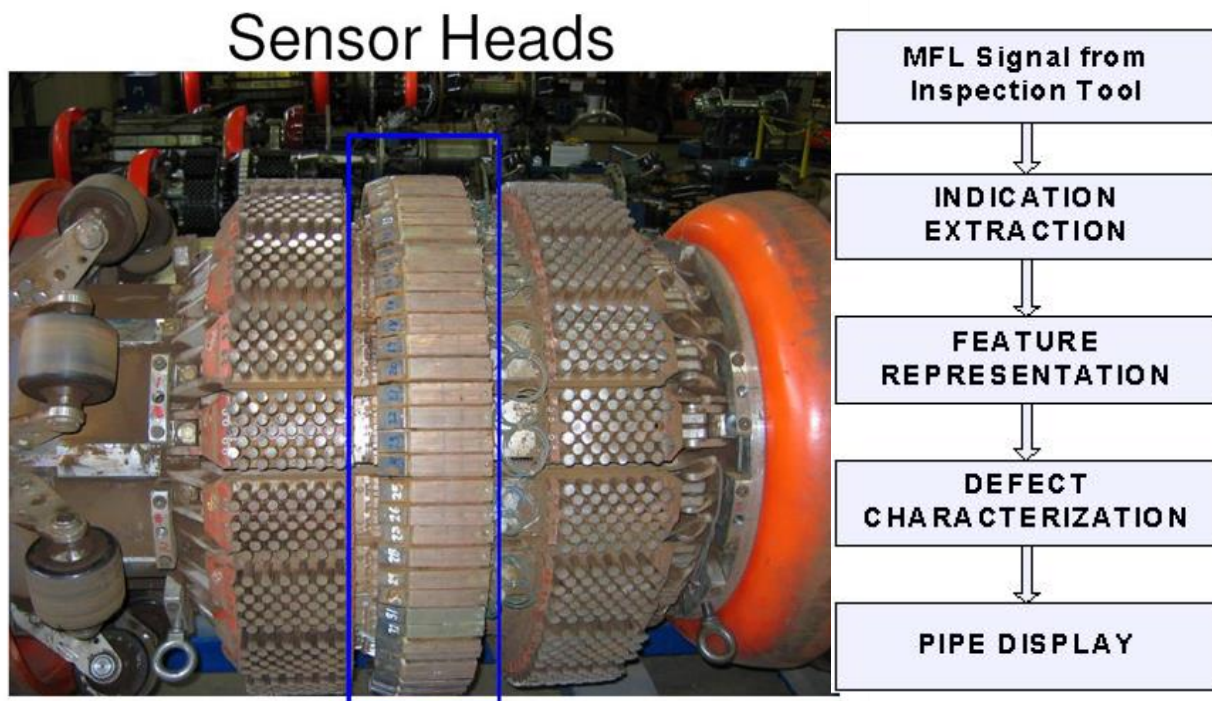


Figure 1: Framework for Automated MFL Signal Extraction and Classification

CONTACT:

Dr. Sunil Sinha; Email: ssinha@vt.edu; Phone: 540-231-9420