

Development of an Ultrasonic Pipeline Inspection System (UPIS) for Drinking Water and Wastewater Pipelines

ABSTRACT:

Most municipal pipeline systems in North America are inspected visually by mobile closed-circuit television (CCTV) systems to access the in-situ condition of buried pipes. The video images are examined visually and classified into grades according to extent of damage against established criteria by human operators, who are naturally prone to fatigue and subjectivity. Additionally, a current imaging system like CCTV is able to provide information from within the pipe regarding surface cracks in 2-D only and does not have the capability to provide depth perception. Any study that intends to improve the quality, reliability and effectiveness of condition assessment must aim at developing an inspection method that can add complementary pipe information (depth perception) to existing surface image assessments done on concrete pipes commonly used as gravity storm water and sewer pipes. Therefore, the researchers propose to conduct the entire research study in two phases. Phase-1 (Ultrasonic Sensor Component) will involve the development of a pipe inspection system using ultrasonic transducers and analysis software by the research team at the Non-Destructive Evaluation Laboratory at Penn State. The methods and techniques of assessing buried pipe conditions developed in this research, both hardware and software, will be forged together into a package that will then be evaluated in the field. The field evaluation will be conducted in cooperation with Redzone Robotics and the Pittsburgh Water and Sewer Authority (PWSA).

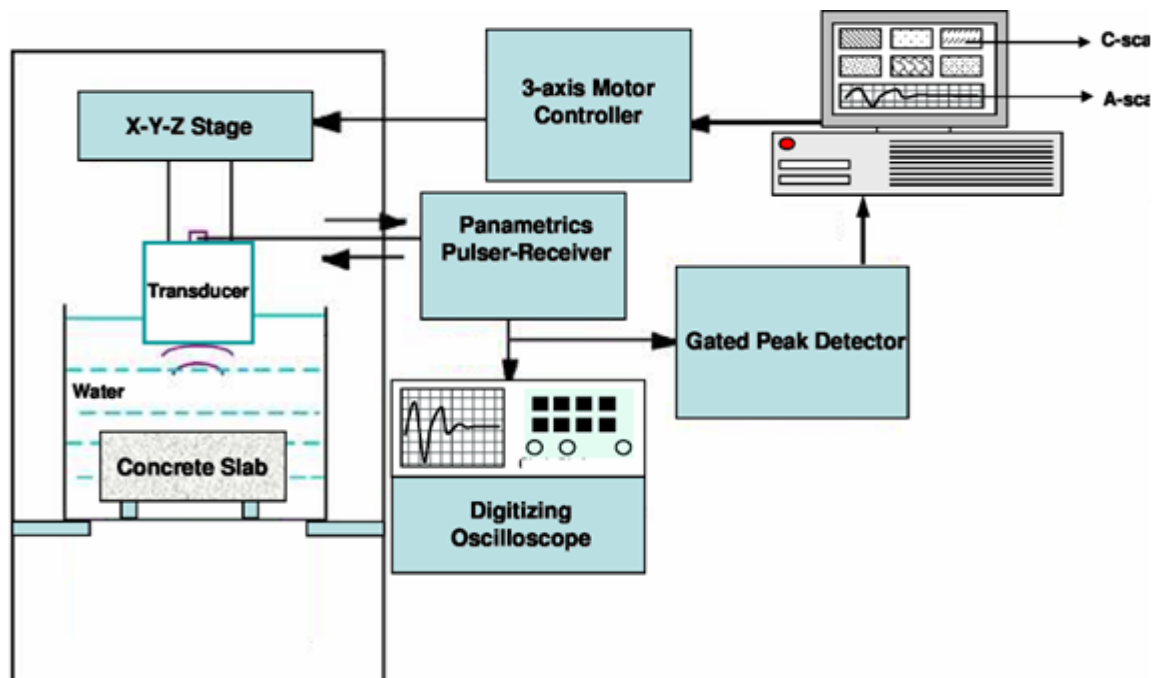


Figure 1: Framework for Automated Ultrasonic Pipeline Inspection

CONTACT:

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