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Dextrous Manipulation of Nondestructive Testing Sensors in Water Mains

Objective

To develop a prototype robotic arm capable of manipulating typical nondestructive testing (NDT) sensors in pressurized water mains

Background

NRC and the University of Regina are collaborating to develop an automated method for inspecting in-service water transmission mains. This work will require a mobile articulated arm to carry and deploy NDT sensors within pipes to which human operators have no access. Such an arm could also be integrated into an inspection robot that is being developed by NRC.

Statement of Work

Develop a prototype robotic arm by:

- developing a robust control system that allows the arm to manipulate sensitive NDT sensors such as ultrasonic transducers in in-service pipes
- building a fully instrumented hardware-in-the-loop (HIL) simulator, including the arm prototype, which precisely mimics the actual condition of in-service pressurized water mains
- determining how effective the NDT sensors are at detecting stress indicators in pipelines while they are being manipulated by a robotic arm

Expected Outcomes

A method for dextrous manipulation of NDT sensors in in-service pipes using an articulated robotic arm

Partners

University of Regina, the City of Regina and TRILabs

Start/Expected Completion Dates

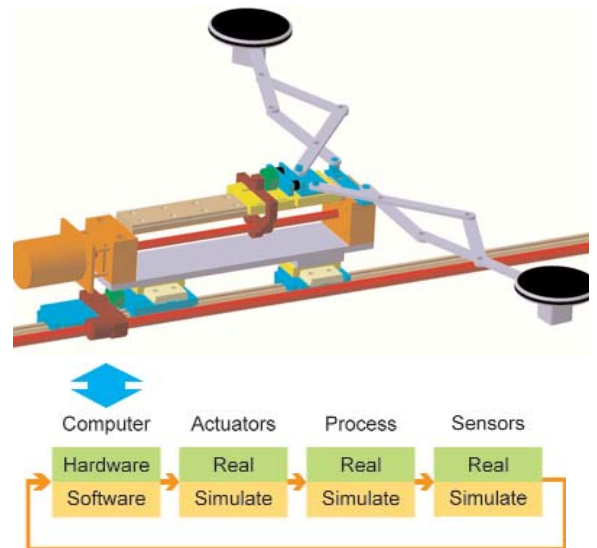
This project began in July 2004 and will be completed in December 2006.

Project Manager

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For more information, see http://irc.nrc-cnrc.gc.ca/ui/bu/sensors_e.html

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Hardware-in-the-loop simulator to mimic a pressurized water main

