Description:
Most of existing inspection robots are not suitable to small varying diameter complex pipe networks. Current invention proposes a hybrid legged design that allows more modules to participate in gripping the pipe wall for improving the pull force. Using a sensorless control strategy, the distance that the feet are extended can be varied to conform to variable piping diameters. Additionally, a steering mechanism comprised of four shape-memory alloy springs allows the crawler to actively navigate through complex branches in piping network.

Applications
- Submarine trim and drain piping system
- Nuclear facilities and power plants
- Oil and gas refineries
- Chemical industries
- Search and rescue operations in disaster zone
- Marine offshore piping systems
- Urban gas line inspection
- Remote to access areas such as underground facilities

Advantages
- Increased load carrying capability
- Adaptability to varying small pipe diameters
- Modular design for flexibility of implementation
- Low cost and scalable for variety of applications
- Broad obstacle avoidance capabilities (sudden diameter change, weld seems, valves, bending, branches, etc.)