Mechatronics Design of an Autonomous Pipe-Inspection Robot

Mohamed Abolella Abdellatif Gaber , Hazem Mohamed2, Mohamed Hesham2, Ahmed Abdelmoneim2, Amro Kamal2 and Ahmed Khaled2

Abstract

Pipelines require periodical inspection to detect corrosion, deformation and congestion with obstacles in the network. Autonomous mobile robots are good solutions for this task. Visual information from the pipe interior associated with a location stamp is needed for inspection. In this paper, the previous designs of autonomous robots are reviewed and a new robot is developed to ensure simple design and smooth motion. Images are processed online to detect irregularity in pipe and then start capturing high resolution pictures to conserve the limited memory size. The new robot moves in pipes and provides video stream of pipe interior with location stamp. The visual information can later be processed offline to extract more information of pipeline condition to make maintenance decisions.

The 4th International Conference on Mechatronics and Mechanical Engineering (ICMME 2017) 2018, February