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# Design of a Wheeled Climbing Robot for Automatic Inspection of Hydraulic Turbine Blade with Curved Surface

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Hydraulic turbine blades are subject to cavitation damage on their curved surfaces induced by the passage of water through the turbine, and therefore the inspection of turbine blade surfaces becomes a key maintenance issue for the power generation industry. To automate the inspection of the blade surface, we developed a novel wheeled climbing robot with a compact visual measurement system. The robot adopts a three-wheeled mechanism and a coupled adhesion technology self-adaptive to complex curved surfaces, so that it can achieve quick motion and stable adhesion on the surface. The images of the blade surface are captured by a CCD camera and transmitted to the operation station by a wireless communication module. The wireless control of the robot, together with wireless inspection, overcomes the umbilical problem of the robot, thus avoiding additional load and expanding the working range. In order to reconstruct the 3-D profile of the cavitation, we designed a compact and low-cost sensor using multi-line structured light. Preliminary experimental results proved the feasibility of the prototype robot, and an outlook to future work concludes this article.

**Ключевые слова:**

**Содержание.**

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