On the Robotization of Precise Levelling Measurements

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SUMMARY

In this paper, preliminary proposals for the robotized precise levelling measurements are presented. Precise levelling is a time-consuming measuring method, which has many repetitive work stages. Basically, the work stages are simple and thus they could be done by robots. The central idea of the proposed method is that an instrument and rods are moved by robots which are affixed to cars. The observer's work is helped by automating the sighting of rods and the recording of observations. In addition to those tasks, observing positions would be possible to determine with the aid of locating sensors. Sketched plans of the grippers which are suitable for the robotized levelling are presented in this work. The gripper for the rod operations keeps a rod in a vertical position so that the rod is resting on a steel plate. The robot's rotation properties are used for the orientation of instruments. The robotized method would be a new way to perform levelling work. Robots would perform arduous tasks and thus the advantages of the method would be related to working conditions. At the moment, it is difficult to say how realistic or practical the proposed method would be, but we can estimate that the method could speed up measurements. The elapsed time for an expedition to measure one setup could be less than 40 seconds and thus the levelled distance could be 40 km in a day, which is more than today's motorized levelling teams can measure.