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Remote capturing of water meter reading using DSP processor

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Abstract:

The scarcity and misuse of fresh water pose a serious and growing threat to sustainable development. The population growth, severe droughts and uneven distribution of water resources are the reasons for water scarcity, and this scarcity will only continue to grow more severe. The technical sophistication of meters for measuring water flows has increased noticeably in recent decades in order to improve management of water. This paper proposes simple image processing approach for remote capturing of water meter reading using DSP processor. The proposed system uses DM3730 digital media processor, comprising of ARM Cortex-A8 and TMS320C64x+ DSP core; capable of executing MIPS. Computationally extensive image processing algorithms are executed using high speed DSP processor, which makes overall system respond faster. As meter image is being captured from set distance, pre-knowledge of meter reading position eliminates the need of algorithms for meter reading detection. The meter reading digits are segmented using pre-knowledge of the aspect ratio and separation distance between two digits in an image. The segmented digits are recognized using template matching algorithm to get meter reading. The extracted meter reading is sent to the central server for billing process. The proposed system improves the efficiency of drinking water management and reduces power consumption as camera is activated, when processor receives meter reading request from central server through GSM modem.

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