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Novel Display and Control for IoT-Based Home Automation

Tyler Steane [1]

RMIT University

Peter Radcliffe [2]

RMIT University

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Abstract

Home automation systems have long been dependent on a permanent central controller, which has many problems, but a significant barrier to eliminating this controller is its ability to supply user interfaces to display the status of devices and control them. This paper proposes a novel protocol which allows any device or several devices, such as a smartphone, to control many devices from any manufacturer in one application in a plug-and-play manner without a central controller. Current approaches to home automation do not offer this functionality,

requiring many applications from many manufacturers. The proposed novel protocol uses a standardised dictionary of UI elements and a minimalist XML device description that describes not only the UI layout for a device but also the device's capabilities and the control procedures for the device. This light-weight all-in-one XML description is a novel combination of display, capabilities, and control and is ideal for the highly contested domestic 2.4 GHz Wi-Fi space. This is achieved without the need for a permanent central controller or an Internet connection and together with other protocols allows the elimination of the permanent central controller.

(Please refer to PDF download link for full paper.)

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