

IoT Sensor Integration in Smart Buildings for Climate Sustainability

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Abstract: Internet of Things (IoT) deployments offer a much higher value proposition if these can function in the context of smart buildings. Such advanced information and communication technology (ICT) applications in commercial buildings, schools, libraries, shopping centers, etc. offer low cost but highly effective monitoring and control opportunities. Sensors deployed in key locations can monitor the building environment in real-time, collect information for intelligent decision making, and facilitate various services. An IoT sensor platform has been developed that provides a unified communication platform which can integrate information from disparate sources and provide one control hierarchy. It is a powerful, low-cost, open-architecture software platform that can monitor and control major electrical loads (e.g., HVAC, lighting and plug loads), as well as solar PV systems, energy storage units and other IoT sensors in commercial buildings. This platform leverages machine learning algorithms to draw insights from a deployed building's historical operating data and occupant preferences to save energy (kWh) while increasing occupant comfort. Such energy savings contribute to climate sustainability through the reduction of carbon emissions.

Bio: Professor Saifur Rahman is the founding director of the Advanced Research Institute at Virginia Tech, USA where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment. He is a Life Fellow of the IEEE and an IEEE Millennium Medal winner. He is the 2023 IEEE President & CEO and was the president of the IEEE Power and Energy Society (PES) for 2018 and 2019. He was the founding editor-in-chief of the IEEE Electrification Magazine and the IEEE Transactions on Sustainable Energy. He has published over 160 journal papers and has made over five hundred conference and invited presentations. He has conducted several energy efficiency, blockchain and sensor integration projects for Duke Energy, Tokyo Electric Power Company, the US National Science Foundation, the US Department of Defense, the US Department of Energy and the State of Virginia. He has a PhD in electrical engineering from Virginia Tech.