



# A Novel Approach to Improve the Efficiency of Smart Homes Using Embedded Systems

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**Abstract**— People are living in smart homes But They are can't understand how the heating, cooling and ventilation systems around them work. The smart Homes that respond to our behaviour rather than a system that requires us to understand the most efficient way to keep our home comfortable. Now a day the smart home which fairly returns limited feedback about the automated control system in our home. The proposed technique to consider that what are the other meaningful interventions we can make in this system – including behaviour change or new technologies – to achieve the outcomes we actually want in the smart home in the smart city. These problems should be rectified in such a way that the performance of the system is improved.

**Keywords**— *Embedded system, cyber security, Motion analysis, IP node data acquisition system, sustainable fabrication, Swarm chip architecture, Spintronics, Numerical Applications.*

## I. INTRODUCTION

This proposal focuses on the parallel processing, speed of data transport, cyber security, data acquisition system through fabrication for efficient usage of power. The parallel processing will produce some problems like handling data; prioritization and starvation, dead lock etc. The electronic chips transport data through electric charges. To increase the rate of data transport in the system so that the system is in need of a new way to transfer data efficiently as soon as possible with accuracy and a low size, weight and powerful product that must have IP communications capability for locations with limited or totally devoid of fixed infrastructure communications and requiring little or no technical intervention from end-users. Powerful communications capabilities will be built-in to automated systems designed to facilitate a variety of control functions and other enhanced features to the smart homes. Internal control systems will exchange data via complex internal networks; other applications that interface with systems through dashboard displays and devices could share information with other connected systems with cyber security features with sustainable fabrication through swarm chip architecture usage and spintronics on the design for effective usage of the system.

Consider a scenario of a home where works like washing of clothes, cleaning up the floors, security and other basic home management works done with way where we usually get tired. After the advent of semiconductors led to have marvelous inventions which are helping the mankind to have a luxurious

and fearless life but still we are doing some more activities because there is a system which can control that operation but as a human beings we have a fear about whether the control systems are properly working or not and we usually have the fear about the security and other problems on feasibility. Recent developments on this types of systems are still not enough to satisfy some criteria's like Speed of feedback data transfer to the another system.

## II. LITERATURE SURVEY

- A. Interoperability for smart home environment using web services T Perumal, AR Ramli, CY Leong, S Mansor, K Samsudin International Journal of Smart Home 2 (4), 1-16.

This paper explains about the web services which are provided to the smart home environment for the ease of access to embedded systems and feasibility about the automated services to the system

- B. Anomaly detection in smart grid traffic data for home area network. Date of Conference:18-19 March 2016 Date Added to IEEEExplore:04 August 2016 ISBN Information: INSPEC Accession Number:16195307 DOI:10.1109/ICCPCT.2016.7530186 Publisher:IEEE

This paper proposes the data traffic for the home area Network and guides a way for enhancement of efficient usage of data where the data acquisition system works effectively throughout the completion of the process in smart homes.

- C. I THOMA, L. FEDON, A. JARA, Y. BOCCHI, TOWARDS A HUMAN CENTRIC INTELLIGENT SOCIETY: USING CLOUD AND THE WEB OF EVERYTHING TO FACILITATE NEW SOCIAL INFRASTRUCTURES, IN 2015 9TH INTERNATIONAL CONFERENCE ON INNOVATIVE MOBILE AND INTERNET SERVICES IN UBIQUITOUS COMPUTING (IMIS). IEEE, (2015)

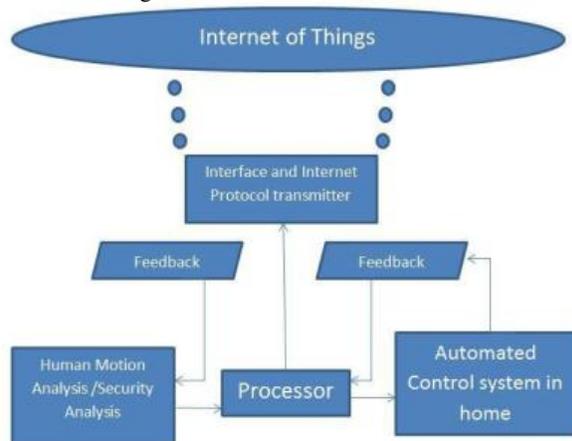
This paper encounters the series of problems with the smart homes at present and the strategies that are to be followed for the effective and intelligent usage of web of everything.



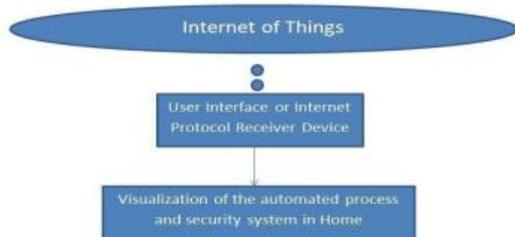
### III. PROPOSED SYSTEM

#### A. Integrated System

The Proposed system may consists of Normal sensing Methods but we a proposing a system with the human motion analysis for the Reduction of complexity of the system. Advances in technology that can monitor human motion have led to the creation of a number of sensors such as Microsoft Kinect, Prime Sense Carmine and Leap Motion. Although originally designed for the computer game market, they have inspired a growth in interest in human motion analysis within the healthcare sector, focusing on areas such as rehabilitation, surgery and assisted living.



The reason this has become a hot topic within healthcare is primarily because technological developments have brought costs down and allowed it to be performed much easier. Until recently motion analysis was performed in a dedicated laboratory and systems would have cost tens of thousands of pounds. They are non-intrusive in comparison to traditional systems and the modality they offer is much more effective in interpreting human body posture and movement than traditional RGB cameras. Wearable health-tech such as smart watches, jewelry, and clothing are some of the latest technologies. Over the next few years we could perhaps see small, lightweight, self-powered implants that monitor and transmit-information.



Already we can RFID 'tag' people – if we can add interfaces to those tags we could really receive parameters about the system, surroundings and automated control progress and providing the feedback to the user through interface/display devices. which can be easily assessable an more secured system and privacy are maintained safe and secure in cloud.

#### B. System to system communication

Powerful communications capabilities will be built-in to automated systems designed to facilitate a variety of driving functions and other enhanced features. Internal control systems will exchange data via complex internal networks; other applications that interface with drivers through dashboard displays and devices could share information with other connected systems; they could also exchange data with connected home side entities, such as streetlights, that are also linked-in to the Internet of Things (IoT).

The one- and two-way electronic communications systems that home systems have increasingly been equipped with over recent decades, such as radio receivers and transmitters, have been augmented by links to cellular voice/data devices and to satellite signals. In-system infotainment networks, and the notion of 'system as-hot-spot', have been introduced by automated OEMs (original equipment manufacturers). These typically co-exist with the automated control networks that enable the transit and exchange of data relating to the operation of the system itself. Fore coming generations of connected home system will differ as a result of moves toward greater convergence between automated communications technology and connections to resources beyond the confines of the car.

The importance of identifying potential 'vulnerabilities' – flaws in a connected system's communications and data systems that could be exploited by somebody seeking to 'hack' into that system's control mechanisms or other onboard technology – and protecting such systems against interference or attack, has stepped up in the last five years, as online menaces have become potentially more hazardous – and more penetrative. Some users are becoming accustomed to the practice of protecting their 'endpoint devices'; but nowadays the very communications infrastructures that form the 'backbone' of our hard-wired and wireless networks regularly come under attack.

This has created yet another 'field of battle' to be defended, as national Internet exchanges, for instance, and the internetworking equipment they rely on – such as switches and routers – are maliciously probed. There are two additional communications types that could supplement these. The more mature of these is system-to-system (S2S) technology that enables home system to communicate wirelessly and even maintain temporary networks between systems that can inform accident prevention, home hazards, and other driving intelligence.

A number of automated OEMs are reported to be developing S2S capabilities. The connected system is also poised to become a bona fide part of the Internet of Things (abbreviated to System-to-IoT), as a connected entity receiving data from external sources, and sharing data that it captures with remote third-parties for specific applications (traffic flow updates, say).

The IoT is an evolving concept, and several aspects of the role of motor systems within it are yet to be determined. Connected home system driving in 'smart' built environments –as to be found in 'Smart City' ventures now emerging around all over the world. Because in future iot play major trending technology.



The world, and being 'retro-fitted' into many existing metropolitan areas – will be able to take advantage of the infrastructure that is gradually assembling to target and support connected home (and indeed human) traffic. It is important to note that the possibility of cyber-attacks on the wireless communications networks that support connected systems should count as another factor in the assessment of automated cyber security factors. This provides the asset management capability to the system.

#### C. Sustainable Manufacturing

For the effective usage of the system we need to opt the smart fabrication technique for the adaptability of the system.

In this case we have Spintronics which utilizes the spin of electrons (angular momentum) to store and manipulate data, promises devices that are faster and more energy efficient than conventional electronics, but a major obstacle has been how to effectively generate the spin current in the first place. Now, scientists have formulated a new method for quickly creating currents using ultra short laser pulses. Since they can "spin up" or "spin down", individual electrons can represent either of the two binary states. It's quickly closing in on the limit to how small we can make current electronics, but spintronics has the potential for much smaller, faster and more energy efficient devices.

And the another trend on fabrication technique for efficient usage is Swarm, a new chip design developed at MIT, could now come to the rescue and unleash the full power of parallel processing for up to 75-fold speedups, while requiring programmers to write a fraction of the code. It is a 64-core chip that includes specialized circuitry for both executing and prioritizing tasks in a simple and efficient manner, taking the onus off software developers. Some systems will face complicated, time-consuming, and add substantial overheads that end up slowing the software's execution. For this reason, parallel programming is usually convenient only for large tasks that number thousands of instructions. The Swarm architecture tackles these problems by featuring specialized circuitry for delegating even the smallest of tasks very efficiently and enforcing a strict priority among them. As a result, programmers can execute tasks in parallel with little overhead, making software run up to ten times faster.

#### D. IP Communication

This communication capability may be done with mobile IP node. It's a low size, weight and powerful product that had IP communications capability for locations with limited or totally devoid of fixed infrastructure communications and requiring little or no technical intervention from end-users. While existing technology consists of radios that operate using wireless bearers over multiple networks, during peak traffic times

or in extreme weather conditions these network scan become congested, restricting the flow of traffic. Our objective was to develop a product that would adapt and select the appropriate medium to communicate securely, should the network become compromised, while at the same time considering, message file size, priority and security levels. We realized early on that existing solutions were designed for static, fixed or portable networks that were not truly dynamic and mobile. What was needed was a product that could be used by all systems of different types allowing them to communicate, while in transit. With the IP (Interface and Internet Protocol Node, we wanted the physical layer of the network to be completely wireless so we had to start from an entirely new perspective. It possess the ability to adapt to different levels of security depending on consumer needs is our key differentiator which also enables cyber security.

#### E. Visualization

Visualization at the receiving end allowing on-set manipulation of 3D assets, live integration of control processing feeds from tracked by Human motion analysis, and live-compositing of either CGI content or background plates from panoramic video, captured by Omnidirectional video rigs will enable the system with the maximum access to the assets going on in a home which is far away from his work place. The CGI content is lit by automatically captured studio lighting, using a new real-time global illumination rendering system

#### IV. RESULT

This Proposal is a Wireless communication warrants particular attention. Despite the fact that the majority of our future systems will still be cabled together and wireless communication will initially only be the solution of choice for mobile systems or systems that are distributed over a wide area, we nevertheless believe that wireless technology and the Internet will revolutionize automation technology. Networks using protocols which find their own way from the sensor to the controller will replace hierarchical designs. Decentralized intelligence will be accompanied by a value shift to the field level, and we believe that new and improved field devices can help increase production output and Status monitoring to ensure high availability and avoid unplanned downtime is becoming increasingly important. This is why the deployment of Asset Management Systems, which provide the framework for status-based maintenance on systems, equipment and components, is so important.

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