



AUN/SEED-Net



8th **AUN/SEED-Net** REGIONAL CONFERENCE ON ELECTRICAL AND ELECTRONICS ENGINEERING

Envision, Enable, and Empower
Smarter and Resilient Societies

co-located with

11th **ERDT Conference** on Semiconductor and Electronics, Information and Communications Technology and Energy

16-17 November 2015
Metro Manila, Philippines



**Proceedings of the 8th AUN/SEED-Net RCEEE 2015 and 11th ERDT Conference
on Semiconductor and Electronics, Information and Communications Technology, and Energy**

Editors:

Dr. Joel Joseph S. Marciano Jr.

Dr. Jhoanna Rhodette I. Pedrasa

Dr. Rhandley D. Cajote

© Copyright 2015 by the Electrical and Electronics Engineering Institute, College of Engineering, University of the Philippines Diliman, Engineering Research and Development for Technology, and ASEAN University Network/Southeast Asia Engineering Education Development Network (AUN/SEED-Net).

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form without the consent of the editors of the Proceedings of the 8th AUN/SEED-Net RCEEE 2015 and 11th ERDT Conference on Semiconductor and Electronics, Information and Communications Technology, and Energy.

ISBN: 978-616-406-075-3

Published by: ASEAN University Network / Southeast Asia Engineering Education Development Network
(AUN/SEED-Net) JICA Project
Faculty of Engineering, Bldg. 2
Chulalongkorn University, Bangkok
Thailand 10330

Printed in the Philippines by: ERZALAN PRINTING PRESS
45 Cotabato Street, Luzviminda Village, Batasan Hills, Quezon City, Philippines

8th AUN/SEED-Net Regional Conference on Electrical and Electronics Engineering 2015

co-located with

11th ERDT Conference on Semiconductor and Electronics, Information and Communications Technology, and Energy

Envision, Enable and Empower Smarter and Resilient Societies

Published by: ASEAN University Network / Southeast Asia Engineering Education
Development Network (AUN/SEED-Net) in partnership with Engineering Research and
Development for Technology (ERDT) and University of the Philippines Diliman.

© Copyright 2015

No part of this publication may be reproduced without the consent of the editors of the
Proceedings of the 8th AUN/SEED-Net Regional Conference on Electrical and Electronics
Engineering 2015 and 11th ERDT Conference on Semiconductor and Electronics, Information
and Communications Technology, and Energy.

ISBN: 978-616-406-075-3

SMART DOMOTIX: IMPLEMENTATION OF LOW ENERGY RADIO FREQUENCY TO HOME AUTOMATION

Jake O. Sabandal*, Jasper D. Mendoza, Randy C. Beros and Nestor C. Tiglao

Ubiquitous Computing Laboratory, Electrical and Electronics Engineering Institute
University of the Philippines Diliman, Quezon City, PHILIPPINES.

*E-mail: jakesabandal@gmail.com

ABSTRACT

Home automation is a well-known concept since the rise of information technologies. Today, with the increasing availability of internet access, implementation of home automation system will be practical, however today's commercially available home automation systems are expensive, not compatible with other technologies or not user-friendly (prior knowledge to electronics is required in order to use the system). This study aims to design, develop and implement a home automation system which is user-friendly, easily deployable and has a plug-and-play capability.

The system implementation is an internet-based and has four main parts: smart plugs, user interface, server and main controller. The appliances will be directly connected to the smart plugs. The smart plugs are responsible for the actuation and power monitoring of these appliances. The user interface, namely the web app and the mobile app can be accessed by the users allowing them to control the system. The instructions from the users and informations from the smart plugs are stored in the server. The server acts as the communication medium between the appliances and the users. The main controller on the other hand, communicates to both the smart plugs and the server. It accesses the instructions from the server and controls the smart plugs.

Through the survey results as shown in Figure 1, we have confirmed that indeed, the system we have developed is user-friendly and is plug-and-play, although further improvements with the size of the smart plug and the speed of the system were highly recommended by the respondents. Figure 2 We also conducted power accuracy tests of the smart plugs and computed for the percent error of the power readings compared to a Voltcraft (commercial power meter) and got a result of an average of 2.27% error which is close enough to commercially available energy meters. Though further improvements can be added to the such as using of much accurate power meters to achieve a more error free results. Also the smart plug can be fabricated using Surface mount devices to minimize the size of the plugs.

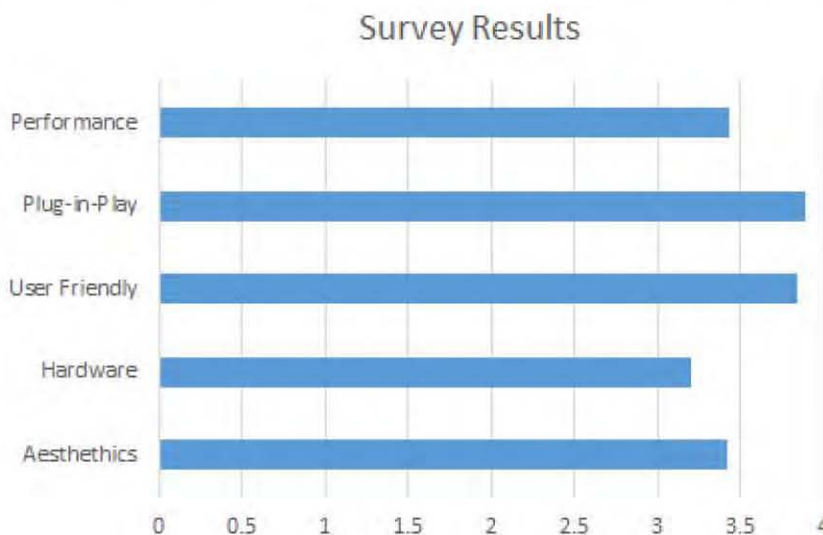


Figure 1. Survey Results

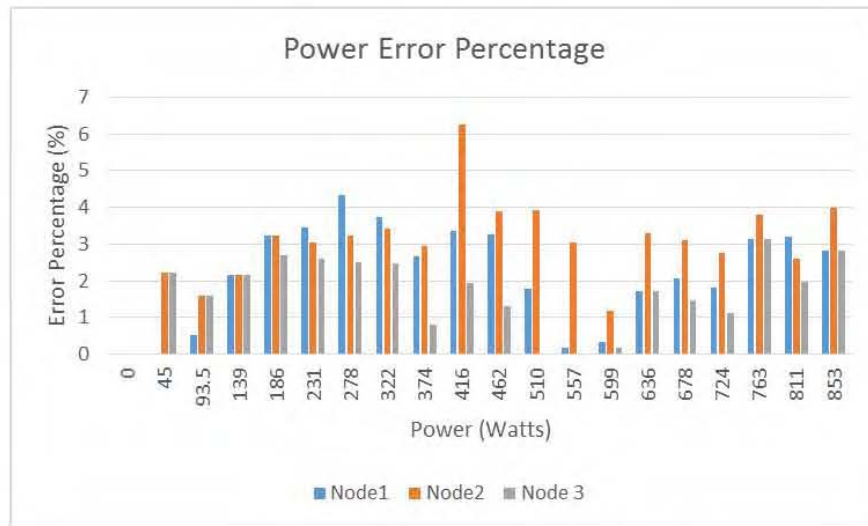


Figure 2. Power Error Percentage.

Keywords: Home-Automation, Smart Domotix, Smart Plugs

References:

- [1]Kumar S.; Lee S. R. “Android Based Smart Home System with Control via Bluetooth and Internet Connectivity”. *18th IEEE International Symposium on Consumers Electronics (ISCE)*, pp.1-2, 2014.
- [2]Wang M.; Zhang G.; Zhang C.; Zhang J.; Li C. “An IoT-based Appliance Control System for Smart Homes”. *4th International Conference on Intelligence Control and Information Processing (ICICIP)*, pp.744-747, 2013
- [3]Teymourzadeh, R.; Ahmed S. A.; Chan K. W.; Hong M. V. “Smart GSM Based Home Automation System”. *IEEE Conference on Process & Control (ICSPC)*, pp.306-309, 2013
- [4]Ramlee R. A.; Tang D. H. Z.; Ismail M. M. “Smart Home System for Disabled People Via Wireless Bluetooth”. *International Conference on System Engineering and Technolgy (ICSET)*, pp.1-4, 2012