Energy Monitoring Annotated Bibliography

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[GRR+12] Karina Gomez, Roberto Riggio, Tinku Rasheed, Daniele Miorandi, and Fabrizio Granelli. Energino: A hardware and software solution for energy consumption monitoring. In *Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt), 2012 10th International Symposium on*, pages 311–317. IEEE, 2012.

Authors of this article are all part of a research team at CREATE-NET, a center for research and telecommunication experimentation. This article describes and introduces the Energino, a standalone plug-load meter based on the Arduino platform. The researchers state that the driving factor behind the Energino's development was the lack of affordable and reliable energy consumption tools, which researchers need for development of simulators. The article goes in depth on the hardware, software, and networking involved in the Energino.

I will use this article as a starting point for my investigation of possible energy monitoring hardware appliances to be used for research purposes. As well as a bench mark by which i will compare other appliances to and data reliability to.

[Har89] George W Hart. Residential energy monitoring and computerized surveillance via utility power flows. *IEEE Technology and Society Magazine*, 8(2):12–16, 1989.

George W. Hart is a resarch professor at Stony Brook University's engineering school where he also teaches mathematics. This article investigates a load monitoring technique for energy monitoring. The non-intrusive appliance covered in this article would be used in homes to provide information on energy consumption on major electrical appliances, although the author does note that uses in the commercial and industrial sectors are possible.
The data collected by the author shows that the appliance is able to take reliable readings and transmit them for use by others, namely to investigate a supposed avoidable energy crisis. The author also goes into a discussion on the danger of the device and its use. Nameles how, if used regularly in homes and by companies for monitoring, it could infringe on the civil liberties and privacy rights of the users. I will use this article as proof, as well as a starting point, that others have designed and worked on such non-invasive energy monitoring appliances that can be universally attached and transmit data readings.

[JDCS07] Xiaofan Jiang, Prabal Dutta, David Culler, and Ion Stoica. Micro power meter for energy monitoring of wireless sensor networks at scale. In *Proceedings of the 6th international conference on Information processing in sensor networks*, pages 186–195. ACM, 2007.

The authors of this article are research professors of electrical engineering at Columbia University in New York City. The article goes in depth on a hardware design of an energy monitoring appliance using their presented SPOT architecture. SPOT stands for, scalable power observation tool. Their design featurs nodes which are used to monitor a range of devices over a

period of time. This article details the hardware level design and disects each part of the design to describe its use. I will use this article as a reference to another technique for energy monitoring as well as for the detailed design on energy monitoring hardware.

[LG09] Bin Lu and Vehbi C Gungor. Online and remote motor energy monitoring and fault diagnostics using wireless sensor networks. *IEEE Transactions on Industrial Electronics*, 56(11):4651–4659, 2009.

Vehbi C. Gungor is a researcher in the Computer Engineering department at Bahcesehir University in Istabul, Turkey and Bin Lu works for Eaton Corp. in Wilwaukee, WI, USA. The articles goes into detail on the process of transmission of data from non-intrusive energy monitoring devices accross wireless sensor networks. The article describes also their lab experiments and test as well as their results. I will use this article as a guide for the similar process of transmitting data over wireless from a energy monitoring device, that I will be working with in my research.

[SA13] Altaf Hamed Shajahan and A Anand. Data acquisition and control using arduino-android platform: Smart plug. In *Energy Efficient Technologies for Sustainability (ICEETS), 2013 International Conference on*, pages 241–244. IEEE, 2013.

Authors Altaf Hamed Shanjahan and A. Anand are both researchers in the department of Electronics Engineering at Anna University in Chennai, India. The article investigates a possible use of the Ardiuno platform for development of a smart plug, a non-invasive universal plug that can be used remotely to monitor energy consumption. This article also goes into detail on the devices connection to an android device for remote monitoring.
I will use this article to aid me in my development of

an appliance with similar characteristics, but less computing power needed, and similar connectivity.