

Design and Development of a Low Cost Domestic Heating System

Anjum Ali

Department of Electrical Engineering,
FAST- National University of Computer and Emerging Sciences,
Lahore, 54700, Pakistan.
anjum.ali@nu.edu.pk

Abstract

This paper presents the design and prototype of a Low Cost Domestic Heating System (DHS) using a state-of-the-art micro-controller based Embedded Control Module (ECM). The prototype is intended for use in experimentation and research leading to the mass production of such systems for use in developing countries where energy resources are limited, and the cost of such resources is relatively high. Any of the available sources of energy, e.g., natural gas, electricity, solar PV, solar thermal, wind energy, or a combination of these, can be used for heating the water. The ECM uses intelligent algorithms to select the optimum source of energy from those that are available at a given location on a given day and time. As a result, the system will offer a cheaper, cleaner and safer solution for domestic heating as compared to the existing heating systems.

Keywords

Domestic Heating, Embedded Control Module, Renewable Energy, Solar Energy, Wind Energy.

Acknowledgements

The author is indebted to his students Kainat Rizwan, Mohsin Ali, and Shawwal Aftab for their excellent work in converting the idea to a working prototype. Mr. Abdul Rauf Mughal, Research Officer, FAST-NU, Lahore also deserves appreciation because of his contributions to this paper.

Biography

Dr. Anjum Ali completed his Ph.D. degree in August 1988 from the University of Alabama, Huntsville, Alabama, U.S.A. He has been teaching Electrical and Computer Engineering subjects since March 1978. His first teaching appointment, as a lecturer of Electrical Engineering, was at the University of Engineering and Technology (UET), Lahore, Pakistan, after winning gold medals in each of the last three years of his undergraduate engineering education.

His teaching experience includes twelve years at Mercer University, Macon, Georgia, USA, and about nine years at three different universities in Saudi Arabia. He has also worked, as an associate professor, at the Lahore University of Management Sciences (LUMS), Lahore, Pakistan, from 1996 to 1998. He served as the chairman of the Electronics Engineering and Instrumentation Department at the Hail Community College (now University of Hail), Hail, Saudi Arabia, from February 2000 to June 2002. During his stay there, he developed a four year degree program in Electrical Engineering for the University of Hail.

Dr. Anjum Ali returned to Pakistan in July 2002, and joined Al-Khawarizmi Institute of Computer Science (KICS) at the University of Engineering and Technology, Lahore, as a professor in December 2002. During his stay at KICS, he initiated many research and development projects and won research grants. He has been a professor of Electrical Engineering at the National University of Computer and Emerging Sciences, (FAST-NU), Lahore, since May 2005.

Dr. Anjum Ali has taught many EE, CE and CS courses and supervised numerous graduate as well as undergraduate students during his 40 years of teaching career. He has over 30 conference and journal publications. He is also the

*Proceedings of the International Conference on Industrial Engineering and Operations Management
Washington DC, USA, September 27-29, 2018*

founding editor of the FAST-NU Research Journal. His areas of current research interest include embedded control systems and computer architecture.