
Nanosatellite Temperature & Humidity Sensor

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Abstract

In this paper, the development of nanosatellite temperature & humidity sensor is presented. Nanotechnology has emerged as a significant field of science and engineering with potential applications across multiple fields, including medicine, electronics, and energy. By studying materials at the nanoscale level, researchers have discovered unique properties that can be harnessed for innovative solutions to real-world problems. Nanotechnology is an area of ongoing research and development with efforts to explore its possibilities and challenges. This paper provides an overview of nanotechnology and its applications, with a particular focus on its use in space exploration. Over the past two decades, the rise of "New Space" has democratized access to space, allowing for the development of small and cost-effective satellites known as nanosatellites or CubeSats. These nanosatellites have revolutionized space exploration, enabling new approaches to space missions and facilitating creative solutions to space-related challenges. Nanosatellites have demonstrated their potential for Earth observation, climate monitoring, scientific research, and commercial applications such as space-based logistics and internet coverage. By using sensors, nanosatellites can collect valuable data and monitor their environments, making them an effective tool for space exploration and research. The work done & presented in this paper is the result of the mini-project work that has been done by the first sem engineering students of the college and as such there is little novelty in it and the references are being taken from various sources from the internet, the paper is being written by the students to test their writing skills in the starting of their engineering career and also to test the presentation skills during their mini-project presentation. The work done & presented in this paper is the report of the assignment / alternate assessment tool as a part and parcel of the academic assignment of the first year subject on nanotechnology & IoT.

Keywords: Temperature, Sensor, Humidity, Nanotechnology, Satellite, IoT

Introduction

The field of nanosatellites has been rapidly expanding in recent years, with increasing interest in their potential applications in various fields [1]. One key aspect of any space mission is the ability to monitor and control environmental factors such as temperature and humidity [2]. To achieve this, a reliable and accurate sensor system is necessary. Nanosatellite temperature and humidity sensors offer a compact and efficient solution for this purpose, with the added advantage of being able to operate in the harsh conditions of outer space [3]. In this context, this article aims to explore the design, development, and potential applications of nanosatellite temperature and humidity sensors [4]. The Fig. 1 gives the design & development of a nano-sensor in the lab-1, whereas the Fig. 2 gives the design & development of a nano-sensor in the

lab-2 (before connecting to the power source). Finally, the Fig. 3 gives the methodology & the block-diagrammatic representation [5].

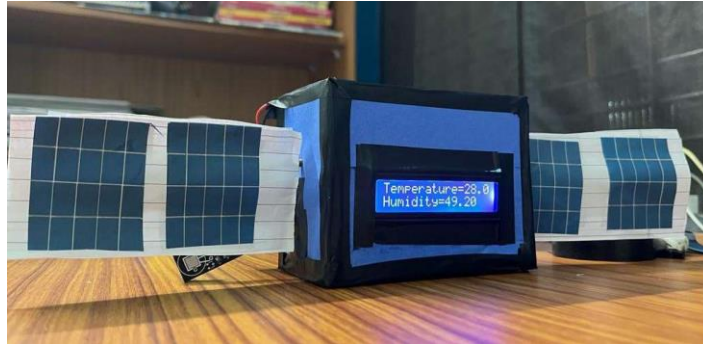


Fig. 1 : Design & development of a nano-sensor in the lab-1

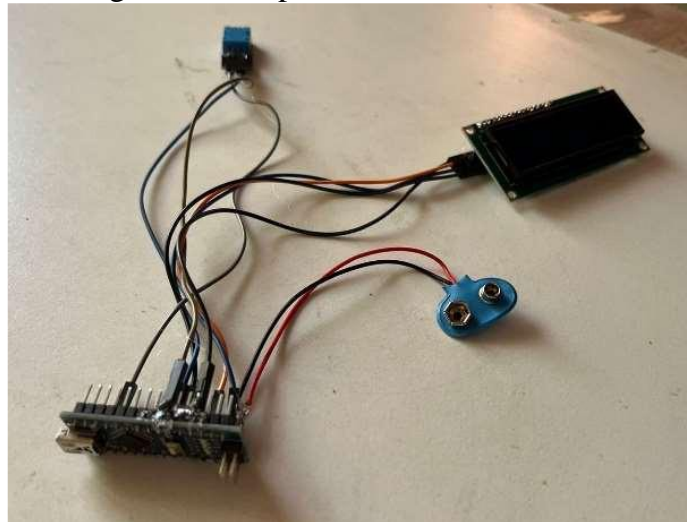


Fig. 2 : Design & development of a nano-sensor in the lab-2 (before connecting to the power source)

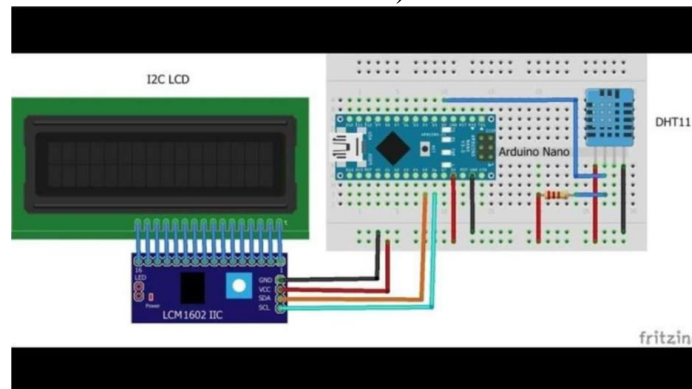


Fig. 3 : Methodology & the block-diagrammatic representation

Design of sensors literature for nanosatellites

Nanosatellites will also be useful in helping humanity prepare for things like natural disasters, for instance, nanosatellites have been developed to predict impending hurricanes [6]. These low-cost, low-flying devices have played a pivotal role in the development of the Internet of Things [7], helping intelligent devices connect to the internet, as well as each other [8]. Current wireless communications technologies, such as 3G, 4G and Wi-Fi, are not able to cover an entire country [9]. However, nanosatellites can, and are opening up the possibility for widespread, effective data communication unfettered by the limitations of their Earthly counterparts [10]. It is no surprise that the increased usage of nanosatellites across the board is being termed the ‘nanosat boom’ [11].

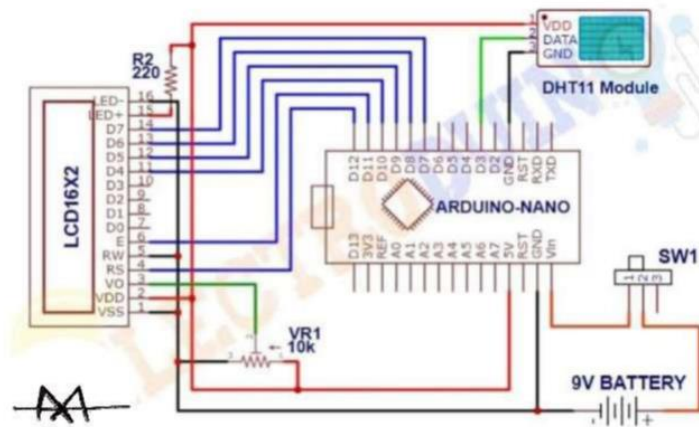


Fig. 4 : Circuit diagrammatic representation of the development of the temperature & humidity sensor

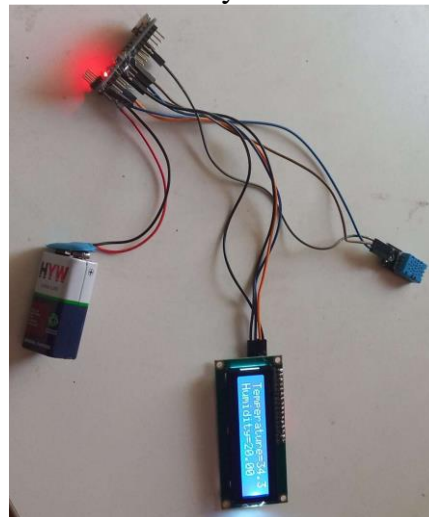


Fig. 5 : Design & development of a nano-sensor in the lab-3 (after connecting to the power source)

Conclusive Remarks

In conclusion, the development of nanosatellite temperature and humidity sensors has significant potential for advancing space exploration and research. These sensors can provide crucial data for understanding the conditions and environments in space and can help improve the reliability and efficiency of nanosatellite systems. The use of nanosatellites also offers a cost-effective and accessible way for students and researchers to participate in space projects and gain hands-on experience in space technology. As the demand for space-based data and research continues to grow, the development of advanced nanosatellite sensors will be essential for expanding our knowledge and capabilities in space exploration [12].

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