

Exploring Television White Space as an Alternative for Wireless Broadband Connectivity

[Ayodele H. Ifijeh](#); [Emmanuel Adetiba](#); [Adeyinka Adewale](#); [Surrendra Thakur](#); [Sibusiso Moyo](#); [Dare O. Emmanuel](#)

Abstract:

Advancement in wireless transmission has enabled the communication among multiple devices all over the world, as well as expanding the frontiers of wireless Internet access. As a result of these advancement, numerous devices are questing for wireless connectivity thereby congesting the existing spectrum. If new measures are not taken to reduce depletion of the reserved radio resource, new allocations of wireless Internet access will be impossible, thereby risking the development of the entire wireless ecosystem. The demands for resourceful spectrum consumption have continually driven researchers and stakeholders in the wireless industry to search for spare radio spectrum to offer affordable and reliable wireless connectivity. The TV broadcasting is not fully utilizing the spectrum in some geographical zone. These TV unused spaces called TV White Spaces (TVWS), are well-thought-out to be the probable future resolutions for unavailability of spectrum. The low frequency band (470 to 694 MHz) of the unutilized TV channel has exceptional broadcast features over extensive distances and enables transmissions through high-rise buildings, trees, and mountains. These features allow the applications of TVWS in Internet of Things (IoT), wireless sensor network, wireless connectivity, wireless switching, smart grid and cities, automated transportation, and logistics as well as connectivity in cloud infrastructure. This paper presents a study on the advantages and benefits of television white space as an alternative to wireless broadband connectivity.

Published in: [2023 2nd International Conference on Multidisciplinary Engineering and Applied Science \(ICMEAS\)](#)

Date of Conference: 01-03 November 2023

Date Added to IEEE Xplore: 29 February 2024

ISBN Information:

DOI: [10.1109/ICMEAS58693.2023.10429782](#)

Publisher: IEEE

Conference Location: Abuja, Nigeria

I. Introduction

White Space according to the European Communications Commission (ECC) is defined as: “A label indicating a part of the spectrum available for a radio communication application (service, system) at a given time in a given geographical area on a non-interfering / non-protected basis with regard to other services with a higher priority on a national basis” [1]. Fig 1 indicates the Electromagnetic Wave Spectrum with the white spaces allocated in the spectrum band in the visible spectrum to television (TV) broadcasting. The TV broadcasting is not fully utilizing the spectrum in some geographical zone [2] [3]. These TV unused spaces called TV White Spaces (TVWS), are well-thought-out to be the probable future resolutions for unavailability of spectrum. Fig 1:

Electromagnetic Wave Spectrum [11]

Sign in to Continue Reading

Authors

[Ayodele H. Ifijeh](#)

Dept. of Electrical & Information Engineering, Covenant Applied Informatics & Communication African Centre of Excellence (CApIC-ACE), Covenant University, Nigeria

[Emmanuel Adetiba](#)

Dept. of Electrical & Information Engineering, Covenant Applied Informatics & Communication African Centre of Excellence (CApIC-ACE), Covenant University, Nigeria
HRA, Institute for Systems, Science Durban University of Technology,, Durban, South Africa

[Adeyinka Adewale](#)

Dept. of Electrical & Information Engineering, Covenant University, Canaanland, Ota, Nigeria

[Surrendra Thakur](#)

KZN e-skills CoLab, Durban University of Technology, Durban, South Africa

[Sibusiso Moyo](#)

Dept. of Electrical & Information Engineering, Covenant Applied Informatics & Communication African Centre of Excellence (CApIC-ACE), Covenant University, Nigeria

[Dare O. Emmanuel](#)

Dept. of Electrical & Information Engineering, Covenant Applied Informatics & Communication African Centre of Excellence (CApIC-ACE), Covenant University, Nigeria

[Udeme C. Ukpong](#)

Department of Mathematical Sciences, School for Data Science and Computational Thinking, Stellenbosch University, Stellenbosch, South Africa

Figures

References

Keywords

Metrics

More Like This

[Internet of Things and Wireless Sensor Networks for Smart Agriculture Applications: A Survey](#)

IEEE Access

Published: 2023

[Data Collection in Studies on Internet of Things \(IoT\), Wireless Sensor Networks \(WSNs\), and Sensor Cloud \(SC\): Similarities and Differences](#)

IEEE Access

Published: 2022

© Copyright 2024 IEEE - All rights reserved, including rights for text and data mining and training of artificial intelligence and similar technologies.