

A Survey On localizing the Drone to realize Mission Critical services with 5G Open RAN Framework

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Abstract: The Objective of the survey is to localize the drones in the mission-critical scenario while performing relief operations where there is an immense requirement for low latency and high reliability by positioning the datacenters closer to the end-user. The Super-resolution direction of arrival technique is used to localize drones i.e., helps in monitoring the journey of the drone in disaster scenarios. This paper is a survey on how a static firefighting scenario utilizing Multiple Signal Classification (MUSIC) Singular Value Decomposition (SVD) Algorithm that helps in estimating the direction of arrival of coherent signals.

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I. Introduction

This paper gives an overview of various generations of Wireless cellular networks and how they are different from each other concerning Radio Access Network (RAN) and one of the very important use cases of 5G i.e. Ultra-reliable low latency communications (URLLC), A highly reliable and low latency dependent static firefighting scenario is considered and how drones help in this scenario for performing disaster relief operations. 5G RAN helps in fulfilling this use case with the approach of a few localization techniques known as Multiple signal classification (MUSIC) with Eigen framework and Music applying SVD for coherent signals. Finally, it draws a conclusion differentiating between MUSIC and MUSIC SVD.

1.1 "Role of 5G Network's: Issues, Challenges and Applications" Arun Kumar Tripathi, Akash rajak, Ajay Kumar Shrivastava

In this paper, the author explains about the evolution of wireless technologies covering from first-generation to fourth generation. Wireless networks of the first generation (1G) were designed primarily for voice communication. It could handle data transfer rates of up to 2.4kbps. Advanced Mobile Phone System (AMPS), Nordic Mobile Phone System (NMTS), Total Access Communication System (TACS), and other 1G-access technologies were the most popular. In 1G, analog signals were responsible for carrying voice. It has several shortcomings, including poor signal quality, low capacity, Insecure data transmission, and unreliable handoff.

The Second Generation (2G) of wireless networks was primarily designed for voice communication and was capable of data transfer speeds of up to 64kbps. Global Systems for Mobile Communications (GSM), Code Division Multiple Access (CDMA), and IS-95 were the most popular 2G-access technologies. Text messages, picture messages, and Multimedia Messaging Services (MMS) were all possible with 2G technology. It can also provide secure point-to-point communication, which means that the message can only be read and received by the intended recipient. 2G had several serious problems, including a slow data rate, limited cell capacity, and a higher handover time.

Second-Generation Network Expansion (2.5G) It was a development of second-generation wireless technology. It introduces the General Packet Radio Services (GPRS), a packet-based switching technique. It can also provide better communication through the use of packet switching and circuit switching techniques. It can transfer data at a rate of up to 144kbps. GPRS, Code Division Multiple Access-2000 (CDMA2000), and Enhanced Data Rate for GSM Evolution (EDGE) were the most popular 2.5G-access technologies.

In the year 2000, the third generation (3G) of wireless networks was standardized. The primary goal of 3G was to provide voice communication and high-speed data transfer of up to 2Mbps. Wideband Code Division Multiple Access (WCDMA), CDMA2000, and Universal Mobile Telecommunications Systems (UMTS) were the most popular 3G-access technologies. Specific applications include video calling, online games, email, and social media services such as Facebook and Orkut were developed to take advantage of 3G smartphone technology.

Wireless networks of the fourth generation (4G) was standardized in 2010. 4G is designed to handle data transfer speeds of up to 300Mbps while maintaining a high level of quality of service (QoS). Users of 4G can watch high-definition (HD) video online and play online games. Voice over LTE (VoLTE) is the most widely