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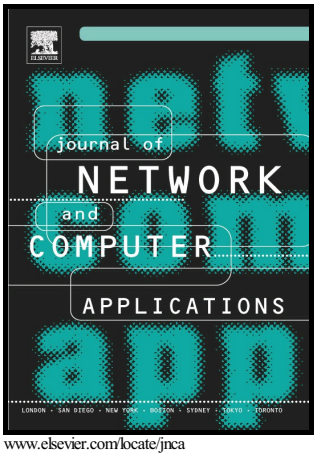

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Routing Protocols Based on Node Mobility for Underwater Wireless Sensor Network (UWSN): A Survey

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ABSTRACT

Recently, the Underwater Wireless Sensor Network (UWSN) is the major research area for researchers due to its versatile applications like: tactical surveillance, seismic monitoring, assisted navigations, pollution monitoring, and many more scientific based applications. Majority numbers of researchers have introduced the routing protocols based on node mobility but still research needs improvement to design the efficient routing protocols which control the node movement. This article focuses the routing protocols based on node mobility with its classification like: vector based, depth based, clustered based, AUV based, and path based. In classification the major focus is on deployment, node mobility, data forwarding, route discovery, and route maintenance. The article also focuses the existing problems in the mobility based routing protocols. We have introduced two analysis methods one is analytical method and other is numerical simulation method. In analytical method we have compared the proposed routing protocols through architectural parameters and performance characteristics parameters. In numerical simulation analysis we presents the simulation of proposed routing protocols through packets delivery ratio and observed that addressing depth based H2-DAB routing protocol remains well performer among all other proposed routing protocols. The core ideas of this research paper will guide the researchers to further research in the field of UWSN routing protocols based on node mobility.

Keyword*:* Mobility; Data forwarding; Depth based; Deployment; Sink node

1. Introduction

Nowadays, resource discovery in the underwater environment has become one of the important goals to reduce dependency on land resources [1]. Due to the underwater harsh environment the discovery of application based information is complicated and costly. The examples of application based information are: tactical surveillance, seismic monitoring, assisted navigations, pollution monitoring, and many scientific based information. The researchers are engaged to retrieve the application based information through the designing of the routing protocols, the researchers have introduced majority numbers of routing protocols; some routing protocols are vector based, some are clustered based, some are geographical routing protocols, and some are path based routing protocols; but still research needs improvement due to underwater behavior and environmental conditions [2]. In underwater environment the RF signaling are not suitable due to long propagation and extra low frequencies; hence, acoustic signals are employed as an enabling communication medium in UWSN [3] . The acoustic signaling also faces many challenges in underwater environment because the propagation delay of acoustic signaling is five orders of magnitude higher than radio signaling. The bandwidth of acoustic signals may also be affected due to distance, noise, and high power absorption [4]. The connectivity between sensor nodes may also be affected due to void regions [5]. Underwater sensor nodes have limited battery power and it is complicated to

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