Abstract

In this paper, the low cost home-made underwater sensors are designed for underwater Acoustics Sensor Network. This system is used to read the values of pressure, temperature and salinity using these sensors under the water and then the values are transmitted from underwater sensor to base station receiver. The sensors are continuously reading these values. Here, the communication channel estimation model is designed using Rayleigh Fading method, where the Gaussian processes for complex values were used. The channel is called Rayleigh Fading since its phase is uniformly distributed in the range of \((0, 2\pi)\) for the zero value of the coefficients of amplitude and phase for time-varying delay line complex channel.
Different algorithms and formulas are used for successful transmission of these values from one sensor to another. Acoustic channel is used for data transmission, which is estimated using Scattering function estimation and maximum data transmission can be possible using OFDM technique. Since the scattering nature of underwater communication raised the problem of multipath fading, Doppler delay, Doppler shift and Doppler spread. These all issues were tried to solve based on the maximum entropy modeling method. In this method the Doppler spread were identified in between the transmitted signal and the received signal. In this paper all the proposed method is tested with Matlab codes and their result are shown in terms of different plots. The hardware is designed and tested in shallow water environment and further be tested for other environment. The Matlab results are shown here for scattering function and absorption loss.

References

- Zamescu George, Department of Electrical Engineering and Telecommunication, Faculty of Electromechanics, Maritime University of Constanta, Romania, Received: July 30, 2013, Accepted: August 15, 2013, Published: August 31, 2013 at Journal of Communication and Computer 10 (2013) 1131-1138.
- Baosheng Li, Student Member, IEEE, Shengli Zhou Member, IEEE, Milica Stoianovic,
Data Communication using OFDM System for Underwater Acoustic Sensor Network

Member, IEEE, LeeFreitag, Member, IEEE, and Peter Willett, Fellow, IEEE,&quot;Multicarrier Communication over UnderwaterAcoustic Channels with Non-uniform Doppler Shifts&quot;; IEEE JOURNAL OF OCEANIC ENGINEERING REVISED) January 29, 2008 DRAFT.


- Kai-Kit Wong, Student Member, IEEE, Roger S. -K. Cheng, Member, IEEE, Khaled Ben Letaief, Senior Member, IEEE, and Ross D. Murch, Senior Member, IEEE,&quot; Adaptive Antennas at the Mobile and Base Stations in an OFDM/TDMA System, IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 49, NO. 1, JANUARY 2001 195

- Byung-Chul Kim and I-Tai Lu, Center for AdvancedTechnology in Telecommunication, Department of Electrical Engineering, Polytechnic University, 901 Route 110, &quot;Parameter Study of OFDM Underwater Communications System&quot;; IEEE journal, 2000 at 7803 –6551.

- B. Benson, Y. Li. R. Kastner, Department of Computer Science Faunce, K. Domond, D. Kimball, C. Schurgers California Institute for Telecommunications and Information Technology,UCSD, &quot; Design of a Low- Cost, Underwater Acoustic Modem for Short-Range Sensor Networks&quot;;

- Hai Yan, Shengli Zhou, Zhijie Shi, Jun-Hong Cui, Lei Wan, Jie Huang, and Hao Zhou The Underwater Sensor Network Lab, University of Connecticut, Storrs, CT 06269, USA,&quot;DSP Implementation of SISO and MIMO OFDM Acoustic Modems&quot;;

Index Terms

Computer Science
Communications

Keywords
