Live Substance in Cyberspace - Biodriver System

Ruslan Kirichek*, Rustam Pirmagomedov*, Ruslan Glushakov**, Andrey Koucheryavy*

*Department of Telecommunication Networks and Data Transmission, St.Petersburg State University of Telecommunication, Russia

**Military Medical Academy, St.Petersburg, Russia

kirichek@sut.ru, lts.pto@yandex.ru, glushakovruslan@gmail.com, akouch@mail.ru

Abstract— The internet of bio-nanothings has become an important research topic last years, because of the broad opportunities for the new applications that it provides. The key problem which should be solved is a creation of its-bio interface for integration of the living substance into the cyberspace. This paper formulates the general conjugation principle of a living substance with an infocommunication system, and develops an integrated system enabling quantitative and qualitative measurements of the certain processes occurring in living organism with a feedback. The study reveals the design of an integrated system and the way of interaction between components can be organized. Further, the paper reviews the medical health status indicators that can be used in an integrated system for analyzing the processes occurring in the body. Then, the possible applications as well as the open research problems are presented.

Keywords— Internet of Things, it-bio interface, Internet of bio-nanothings, body area networks, health status monitoring



Dr. Ruslan Kirichek working in St.Petersburg University of Telecommunication as Associate Professor Department of Telecommunication Networks and Data Transmission. He was born in 1982 in Tartu (Estonia). He graduated Military-Space Academy A.F. Mozhaiskogo and St.Petersburg University of Telecommunication in 2004 and 2007 respectively. R.Kirichek received Ph.D from St.Petersburg University of Telecommunication in 2012. Since 2004 he worked at IT-department of the Air Force as a senior engineer. Since 2008 worked as a senior researcher at the Federal State Unitary Enterprise "Center-Inform". Supervised research testing communication networks in terms of destructive influences. Since 2012 worked as the Head of the Internet of Things Laboratory at St.Petersburg University of Telecommunication.



Dr. Rustam Pirmagomedov was born in Surgut (Russia) 19.07.1988. In 2010 he graduated from St.Petersburg State University of Telecommunication (SUT). In 2014 he received the Ph.D. in SUT. Now Rustam Pirmagomedov working as associated professor of the department "Telecommunication Networks and Data Transmission" in SUT. His scientific areas of interest are the IoT, nanonetworks, body area networks, it-bio interfaces.



Dr. Ruslan Glushakov was born on April 16, 1982 in Kaliningrad, Russian Federation. From 1999 till 2006 studied at Military Medical Academy. After graduating from Military Academy served in the Navy as a chief medical officer. In 2011 returned to the Military Medical Academy as a surgeon, than inspector, from 2013 to present senior assistant the head of the research division of Military Medical Academy. In 2012 he became the Ph.D, dissertation topic "Biological markers of aggressiveness of hormone-dependent tumors in the altered thyroid status".



Dr. Sc. Andrey Koucheryavy was born in Leningrad 02.02.1952. After graduated from Leningrad University of Telecommunication in 1974 he going to Telecommunication Research Institute named LONIIS, where A.Koucheryavy working up to October 2003 (from 1986 up to 2003 as the First Deputy Director). He became the Ph.D. and D.Sc. in 1982 and 1994 respectively. A.Koucheryavy is the St. Petersburg State University of Telecommunication (SUT) professor from 1998. He is Chaired professor of the department "Telecommunication Networks and Data Transmission" from 2011. He is honorary member of A.S.Popov's society. Prof. A.Koucheryavy was the vice-chairman Study Group 11 ITU-T (Study periods 2005-2008, 2009-2012). His scientific areas of interest are the network planning, teletraffic theory, IoT and its enablers