SPACE LIFE SCIENCES SYMPOSIUM (A1)
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PERSPECTIVE USE OF THE TECHNOLOGIES FOR "BIG DATA" ANALYSIS IN MANNED SPACE FLIGHTS ON THE INTERNATIONAL SPACE STATION

Abstract

Recent technologies in the area of Big Data analytics which provide fast and effective review of various and diverse files of information arriving from different sources are being developed increasingly. Various new software are being proposed to provide useful results in this area. Such technologies are the important stimulus of modern scientific and technical progress, in particular in the field of development of piloted space flights. In this publication we present the prospects of the use of Big Data analytics technology in a system of medical control of crews of the International space station (ISS) .Today there is an active accumulation of experience of piloted space flights on ISS where the international scientific and technical cooperation actively develops. An important step within this direction is the organisation of a new joint Russian-Canadian space experiment "Cosmocard 2018". It will build on the Russian experiment "Cosmocard" which is currently being carried out on the ISS since September, 2014. In this project we have begun work for the modernisation of the software for the onboard computer which will enable the estimation in real-time of a mode of state of health of members of the crew. The Artemis platform, a Big Data analytics platform proposed by McGregor for the analysis of great volumes of physiological and other environmental data, will be used for this purpose. We have begun to reengineer algorithms for definition of a functional condition of an organism and risk of development of diseases developed previously by the Institute of Biomedical Problems of the Russian Academy of Sciences to run in real-time within the structure of the new software for the onboard computer that is based on Artemis. These new algorithms will be tested, in the beginning, during simulation experiments with long isolation using the same physiological monitoring devices "Cosmocard", currently used on the ISS as part of the current Cosmocard experiments. They will also be used during research involving various groups of people working in the conditions of chronic stress, sportsmen and the eldery. In addition, the gathering and transmission to an onboard computer of the physiological information from the cosmonaut utilizing wireless data transmission over extended periods of time will be modernised also.