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AN OPEN SOURCE STRATEGY TOWARDS THE DEVELOPMENT OF A GEO SPATIAL FRAME WORK IN PUBLIC HEALTH DOMAIN

Abstract

Remote sensing techniques are turning earth in to new frontier by driving deeper understanding of earth's complex systems in a way that will greatly improve our predictive capability and bring vital societal benefits to people around the globe. The economic feasibility and flexibility of earth observation (EO) data sharing principles have made the data increasingly available to the global community. However these data collected is just a fraction of what could be put to excellent, perhaps life saving use in every region of world. Lack of comprehensive integrated approach had led to gaps in scientific understanding and effective usage of available data. An integrated application of remote sensing techniques for decision making is needed in various fields, especially in medical research and health care analyses.

Earth science application to public heath varies from infectious disease mapping to emergency preparedness and response planning. Remote sensing has been used to target sampling efforts and health interventions, and in the modelling of chemical and other exposures. The increased resolution of satellite images have enabled the examination of broad scale patterns in landscapes that may help to prevent spread of diseases , delineate habitat patches for disease vectors , and measure environmental or bio physical variables (e.g., temperature, amount of vegetation). The globally available EO data should be integrated and automatically transformed to useful information that can be accessed by physicians across the world, thus making it a tool for effective medication. Web mining technology along with recent intelligent techniques can be effectively used to build an automatic frame work in public health domain to achieve the goal.

In this paper we discuss the development of an open source geospatial frame work for supporting various analyses in public health domain using data mining, web GIS and artificial intelligence techniques. Methodology exploits the automatic analysis of different open source EO data (e.g. USGS) available online so as to provide relevant information to public health professionals. System is provided with a web interface to make it able to be accessed globally. The open source web GIS techniques are well exploited to facilitate various geospatial analysis related to public health domain in addition to data recording and geo visualization. The system has been evaluated over sample patient data available from NIMHANS and proved to facilitate the representation of various analyses in addition to diagnostic as well as predictive support.