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Data analytics, the digital patient and simulation in healthcare

The dramatic growth in data about the human body and the human in social context combined with the progress in informatics, and modeling and simulation present an opportunity to realize a thirty-year old vision for a virtual human. This virtual human, however, will be far more sophisticated than the initial vision in that it will be capable of serving as a platform for research, education, patient care, drug and device testing. It will also be capable of accurately representing individuals and populations over time for purposes of screening, prevention, treatment, and analysis. The more accurate descriptor is to think in terms of a digital patient platform with infinite combinatorial possibilities. The objectives of this presentation are to provide an update on the status of a variety of international research efforts to extend human physiome research to include the social, behavioral and societal systems necessary to construct the digital patient and to discuss the opportunities to developing new models and simulations that will use the digital patient platform. The goal of the digital patient is to develop a database, software and analytic framework that integrates biological systems (body, organ, tissue, cells, molecules), a variety of scientific disciplines (biology, physiology, biophysics, biochemistry, molecular biology, bioengineering or social science), anatomical sub-system (cardiovascular, musculoskeletal, gastrointestinal, etc.), social context and data analytics. This presentation provides an overview of the major research initiatives that are underway, and the challenges that must be addressed, particularly in the use of sensors and the aggregation of data into usable formats.

Biography

C Donald Combs, PhD serves as Vice President and Dean, School of Health Professions, at the Eastern Virginia Medical School (EVMS). He holds faculty appointments as tenured Professor of Health Professions at EVMS, Professor of General Medicine at the State Medical and Pharmaceutical University "Nicolae Testemit-sanu", Visiting Professor of Medical Simulation at University of Paris—Descartes and as Adjunct Professor of Modeling, Simulation and Visualization Engineering at Old Dominion University. From 1996 to 2002, he also served as a Senior Fellow at the US Naval Postgraduate School.

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