



## Department of Computer Science

# Big data analytics in healthcare: Towards predictive, personalized, integrated medicine

Seven and a half million years of calculation were needed by the supercomputer “Deep Thought” to find “42” as the answer to “life, the universe, and everything”. And it took another 10 million years to find the question which would give the answer meaning. Unfortunately, a consortium of psychiatrists, who feared for the loss of their careers when the meaning of life became known, subverted this process 5 minutes before its end. That was in 1978 (Douglas Adams). But by 2045 the exponential increase in technologies like computers, genetics, nanotechnology, robotics, artificial intelligence will lead to a technological Singularity, when machine intelligence will be billions of times more powerful than all human intelligence combined (Ray Kurzweil).

In the meantime, IBM’s super computer Watson has been programmed with 600,000 pieces of medical evidence from over two million pages of medical text as well as the entire English version of Wikipedia all stored in 15 terabytes of RAM (15 trillion bytes of memory). And *in silico* medicine and the global virtual physiological human (VPH) community are set to “revolutionise” healthcare by integrating ideas (paradigms – Thomas Kuhn), tools (Peter Galison), big data, HPC. The presentation will explore and critically reflect these developments and their potential to indeed help our health systems to eventually progress towards a more predictive, personalised, integrated medicine. This has been a dream of public health actors already 60 years ago, and it will need interventions and policy measures beyond big data analytics to realise it.

**Dr. Karl A.  
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**empirica  
Communication &  
Technology Research  
Bonn, Germany**

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Room: 1079  
Senate Chambers**

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**Prof. Dr. Karl A. Stroetmann** MBA PhD FRSM is Senior Research Associate with empirica Communication & Technology Research in Bonn, Germany, adjunct assistant professor at the School of Health Information Science, University of Victoria, BC, Canada, and Fellow of the Royal Society of Medicine, London, UK. Karl received an MBA. from the Free University in Berlin, Germany (1968) and was awarded a PhD in Business Administration and International Finance by the University of British Columbia in Vancouver, Canada (1974).

Under his leadership empirica has established itself as a leading European institute with a broad understanding of policy, strategic, healthcare, clinical, business and socio-economic issues surrounding eHealth. Karl has provided services to European Commission (EC), European Parliament (EP), Organisation for Economic Co-operation and Development (OECD), World Health Organisation (WHO), European Space Agency (ESA), industrial players, national governments, healthcare providers, healthcare insurances, and other stakeholders. He was/is principal investigator in European, trans-Atlantic and African studies on eHealth policy issues, strategy and business development, socio-economic impact assessment, and health RTD projects.