IEEE COMPUTER SOCIETY 2022 REPORT

Dejan Milojičić, Ph.D.

HP Labs, USA, 2014 IEEE Computer Society President

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Mathematical Institute of the Serbian Academy of Sciences and Arts
Knez Mihailova 36, room 301f

Abstract:

Predicting future is hard and risky. Predicting future in computer industry is even harder and riskier due to dramatic changes in technology and limitless challenges to innovation – to bringing new technology into a broad use. Only a small fraction of innovations are truly disrupting the state of the art. Some are not practical or cost-effective, others are ahead of its time, yet others do not have market. Nine technical leaders in IEEE Computer Society have spearheaded writing a Technical Report titled IEEE CS 2022, symbolically surveying 22 potential technologies that can change the landscape of computer science and industry by the year 2022. In particular, they have surveyed the following technologies: 3D printing, big data and analytics, open intellectual property movement, massive online open courses, security cross-cutting issues, universal memory, 3D integrated circuits, photonics, cloud computing, computational biology and bioinformatics, device and nanotechnology, sustainability, high performance computing, the Internet of things, life sciences, machine learning and intelligent systems, natural user interfaces, networking and interconnectivity, quantum computing, software defined networks, multicore, and robotics.For each of the 22 technologies, a common approach has been taken: summary of the state-of-the-art, challenges, where we think the technology will go, and what is disruption. We have tied these technologies into a common scenario that we call seamless intelligence. Together they represent a common view of the future. Independently, we have surveyed a few thousand IEEE members on the technology drivers and disruptors. They have confirmed some of our predictions and provided another perspective on the future of technology advancements. Finally, we have endeavored to predict what kind of future society is needed for our profession, for professionals that will be learning, practicing and putting into use the technologies we presented in this paper.This presentation was intended for computer science professionals, students and professors, as well as laymen interested in technology and technology use. It is also targeted to members of computer society and similar societies around the world, daring to predict what kind of a future professional society will be best suited to take discussed technologies to the next level through its publications, conferences, communities, standards, courses, and future artifacts in support of our profession and humanity.

About the Speaker:

Dr Dejan Milojičić is a senior researcher and senior manager at HP Labs, Palo Alto, CA, working in the technical areas of systems software, distributed systems, high performance computing and service management. He is IEEE Computer Society 2014 President. He is a founding Editor-in-Chief of IEEE ComputingNow (2008-2012) and past chair of IEEE Technical Committee on Operating Systems (2000). He has been on many program committees of ACM, IEEE and USENIX conferences (ICDCS, CLOUD, ICWS, EDOC, AAMAS, ICAC, Middleware, HotCloud, IC2E, etc.) and on journal editorial boards (IEEE Internet Computing and IEEE Transactions on Cloud Computing). He has been a member of IEEE CS, ACM, and USENIX for over 20 years. He worked in OSF Research Institute, Cambridge, MA [1994-1998], and Institute "Mihajlo Pupin", Belgrade, Serbia [1983-1991]. He is teaching a class on Cloud Management at SJSU, San Jose CA. He received his PhD from University of Kaiserslautern, Germany (1993); and MSc/BSc from Belgrade University, Serbia (1983/86). He has been on 6 thesis committees (GaTech, UIUC, Monash, USP) and has guided over 40 interns. Dejan is an IEEE Fellow, ACM Distinguished Engineer, and USENIX member. Dejan has published over 130 papers and 2 books; he has 12 patents and 25 patent applications.