

- ◆ "Next Generation Internet (Post IP) and 3D Internet leading to 4D Mobile": R. Tafazolli, University of Surrey

There has been an explosion in use of internet ignited by popularity of the social networking services. In general, social networking services, such as MySpace, Facebook and Bebo, allow users to create a profile for themselves and share it with friends. Another type of such services is based on creation of virtual world(s), a world where its users inhabit and interact via avatars, and with new or real world rules such as gravity, topography, locomotion, real-time actions, and communication. Communication has, until recently, been in the form of text, but now real-time voice communication using VOIP is available. This type of virtual world is now most common in massively popular multiplayer online games.

As humans we are used to live in a three dimensional world, and it is natural to like to view 3D animations, 3D graphics, and the world of 3D pictures in general. What is true today for games and social networks will become mainstream for many business relationships in near future. It will soon be unacceptable to provide web-pages without 3D animation, without 3D ports into which the user can enter to experience a 3D world of demonstrations, products, customer centers, or stores. This 3D world will require a large increase in data volume to be transferred, some with strict realtime requirements, some with somewhat relaxed realtime but high integrity requirements.

Mobile and Wireless Communications mission has always been to offer at least the same services as offered by fixed networks with the valuable mobility service enabling anywhere, anytime communications on personal level. Continuing with its mission, the next challenge Mobile technologies are facing is provision of not only anytime anywhere communications, but anytime anywhere *doing everything*. Everything includes communications, as well as education, entertainment, arts, trade, virtual holidays, to creation and living in virtual countries, and even creation of new worlds with their own rules and regulations. Effectively everything that may or may not be possible in the real world. People can create multiple versions of themselves in virtual world and carry on living forever after death of their mortal bodies.

The next step in evolution of such services is their enhancement to create an environment similar to the 3D world we live in. The 3D presentations with mobility combined with other multi-sensory information from a user context will be needed to personalise such services and using networked actuators to create appropriate ambience that a user demands in a real world creating a 4D mobile internet.

The presentation will start off by reviewing the shortcomings of current internet with respect to expected usage, technical limitations and research challenges and logical approach to next generation of Internet in Post-IP era. The technical challenges for provision of efficient 3D internet and in particular 4D Mobile Internet are also presented, highlighting the roles of wireless sensors and actuators and importance of service and networked information architectures.

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