# Future Internet Services and Architectures: Trends and Visions

## Guest editorial

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This special issue on *Future Internet Services and Architectures: Trends and Visions* is a selection of seven papers presented at the Workshop *Future Internet Architectures*, (open) second Euro-NF Workshop and Future Internet Cluster Meeting, June 9, 2009, Santander, Spain; co-located with the EU ICT Mobile Summit 2009. In this special issue, novel work and ideas are presented including first qualitative and quantitative results. Each paper has been reviewed by three expert reviewers. The guest editors would like to thank all workshop participants, paper authors, and reviewers for their outstanding work on this special issue.

The "Future Internet" or "Internet of the Future" is a demanding research field. On the one hand, multimedia entertainment services and smart networked services for every-day activities are more and more requested by users ubiquitously, anywhere at any time. On the other hand, heterogeneous networks are connected ranging from optical networks, WiFi hotspots, mesh networks, 3G to upcoming 4G networks, Near Field Communication (NFC) and Wireless Sensor Networks. To cope with this complexity and flexibility of networking, new self-organizing and adaptive methods are required to make these plethora of connected networks work effectively and efficiently.

In the *Future Internet Architectures* workshop, a variety of inspiring approaches have been presented ranging from disruptive network architecture assumptions and designs, such as opportunistic and context-aware or socially-aware networks, discussion on network virtualization to address the ossification of the Internet, to the effects of new networking paradigms in terms of cost and quality of experience which are two important aspects of networks from the user perspective.

The paper *Cost Models for QoS-differentiated Interconnecting and Wholesale Access Services in Future Generation Networks* by Alberto Eloy García, Laura Rodríguez de Lope, and Klaus D. Hackbarth, presents a cost model considering different traffic types and multiple service providers capable of supporting different multimedia services in terms of Quality of Service (QoS) and of aggregating available network resources. The perspective of a best fitting architecture for future Internet services is taken by the authors Nikolaos Fotiou, Dirk Trossen, and George C. Polyzos in their paper *Illustrating a Publish Subscribe Architecture*. This architecture uses the publish subscribe pattern for offering and providing services in a clean-slate approach describing in detail how the new approach will be implemented.

Overlays are among the key enabling technologies for forming flexible networks. From the perspective of network coding, Luísa Lima, Diogo Ferreira, and João Barros discuss network coding for small range wireless network data dissemination in comparison to larger scale peer-to-peer networks in their work *Topology Matters in Network Coding*. Similarly, by introducing overlays, in the work *Context-based Wireless Mesh Networks: A Case for Network Virtualization* by Ricardo Matos, Susana Sargento, Karin A. Hummel, Andrea Hess, Kurt Tutschku, and Hermann de Meer, networks become context-aware. Virtualization is used to build multiple virtual networks on top of the physical networks corresponding to the user's current context and needs. By addressing the challenge of resource alloca-

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tion within physical networks to setup virtual resources, the paper *Optimal Mapping of Virtual Networks with Hidden Hops* by Juan F. Botero, Xavier Hesselbach, Andreas Fischer, and Hermann de Meer, makes use of optimization theory where the presented approach assures a certain degree of fairness while performing resource allocation.

Flexibility of networks is also an opportunity to make networks more user-centric. The work of Tomasz Ciszkowski, Wojciech Mazurczyk, Zbigniew Kotulski, Tobias Hossfeld, Markus Fiedler, and Denis Collange, *Towards Quality of Experience-based Reputation Models for Future Web Service Provisioning* focuses on the Quality of Experience (QoE) of a user applied to Web services. In detail, this work proposes a reputation system for Web-services based on QoE. Considering relations between users, cooperation in encounter networks can be controlled as described by the work of Bernhard Klein and Helmut Hlavacs: *A Socially Aware Caching Mechanism for Encounter Networks*. This paper presents caching techniques which are considering social relations for caching decisions.

The guest editors are confident that the content of this special issue is of interest to readers who want to enhance their knowledge in novel approaches to tackle and utilize the growing flexibility of the "Future Internet". Going one step further, this special issue intends to foster discussion and to encourage future research in the directions identified by the authors.