Advanced Caching in Wireless Networks

While many existing communication technologies fail to scale with increasing network sizes, recent developments have revealed that caching at wireless edge, i.e. prefetching contents at or closed to the end users, can boost the performance and efficiency of wireless networks. Our workshop will seek to promote an insightful understanding of the fundamental elements behind some recent breakthroughs and challenges in turning caching into a key ingredient for future wireless networks.

The workshop will address the powerful and entirely novel themes of fusing advanced caching with advanced communication (PHY) techniques, and of unifying communications and networking paradigms for caching. Bringing together a group of research and industry leaders with divergent views, our workshop will address different new directions in using caching for both wired and wireless networks. Technical issues relating to fundamental and practical research topics for wireless caching, will include elements relating to finding PHY schemes that adapt to different wireless traffic or file popularities models, or different algorithms for uncovering temporal and spatial correlations among item popularities. Emphasis will also be placed on new communications techniques such as coded caching, which can allow for communication rates that scale with an increasing number of users, irrespective of how many users are in the network. Different speakers will discuss how properly designed caching schemes enable to improve the performance of various network scenarios such as broadcast channels, interference channels, cloud-RAN settings, multi-cell BS cooperation settings and D2D settings. This has the potential to entirely change the way caching is performed, and for this reason the special session will highlight some of the powerful advanced-caching ingredients that can be applied in different settings, but will also focus on crucial limitations of these techniques, which may potentially be resolved if one takes a broader global view of caching that is carefully adapted to PHY realities.

- Coded caching (performance and complexity considerations)
- Cache-aided cloud-RAN communications
- Cache-aided multi-cell cooperation
- Cache-aided wireless networks that exploit traffic or file-popularities statistics
- Code design for caching
- Fusing caching and PHY
- Feedback-aided caching

- Distortion memory tradeoff
- Caching with cooperation and femto-caching
- Partial caching and video delivery
- Caching and topology
- Caching under security and privacy constraints
- Learning and prediction of popularity
- Energy saving through caching
- Proactive caching and scheduling

Important Dates:

Paper Submission: 18 November 2016
Notification Date: 17 February 2017
Final Paper: 10 March 2017
Workshop Date: 25 May 2017

Organizing Committee:

General Chairs
Petros Elia (EURECOM, France), Mari Kobayashi (Centrale-Supelec, France), Georgios Paschos (Huawei, France)
Program Chairs
Jingjing Zhang (EURECOM), Petros Elia (EURECOM)

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