

Call for Papers — IEEE Journal on Selected Areas in Communications

Recent Advances in Heterogeneous Cellular Networks

In order to enhance network capacity, there has been an increasing interest in deploying relays, distributed antennas and small cellular base stations (e.g. metrocells, picocells, femtocells), e.g., indoors in residential homes and offices as well as outdoors in amusement parks and busy intersections. These new network deployments, comprised of a mix of low-power nodes underlying the conventional homogeneous macrocell network, are usually referred to as heterogeneous cellular networks (HCNs). By deploying additional small cells within the local-area range and bringing the network closer to users, HCNs can significantly boost the overall network capacity through a better spatial resource reuse.

Inspired by the attractive features and potential advantages of HCNs, their development and development have gained much momentum in the wireless industry and research communities during the past few years. For instance, HCNs are being extensively discussed at the 3GPP forum. However, HCNs also come with their own complications, and there are fundamental challenges and significant technical issues that still need to be addressed for their successful rollout and operation.

This special issue will bring together research HetNets articles from a wide range of perspectives in different industrial and academic communities. The goals are to advance the understanding of the challenges faced over the next decade, solidify accepted models and metrics, and catalog innovative approaches to design and deploy HetNets.

General topics:

- New front- and back-haul architectures to facilitate HetNet operation (cloud RAN, user and control plane split, multi-flow, etc.)
- Self-organizing HetNets and issues in self-configuration, self-optimization and self-healing
- Radio resource management (RRM) techniques for HetNets (network synchronization, admission control and quality of service guarantee, cell range expansion, load balancing, dynamic TDD transmissions, etc.)
- Improved mobility management in HetNets and small-cell discovery mechanisms
- Concepts for energy efficiency enhancements in HetNets and dormant mode operation of small cells
- WiFi offloading, and WiFi/cellular coexistence challenges

Topics for co-channel deployment:

- ICIC in HetNets (cell clustering, cell on/off techniques, carrier based ICIC, time based ICIC, power based ICIC, etc.)
- Coordinated multi-point transmission techniques in HetNets (coordinated beamforming, network MIMO, etc.)
- Advanced receivers and interference cancelation in HetNets

Topics for non-co-channel deployment:

- Use of higher frequency bands, radio propagation models and measurement campaigns for small cell networks
- Inter-node carrier aggregation and dual connectivity in HetNets
- Semi-static or dynamic switch between the macrocell and small cell tiers at UEs

In addition to the technical research results, we invite high quality submissions in relevant subtopics not mentioned here. However, papers whose sole purpose is to describe standards or commercial products are not welcome. Prospective authors are invited to contact the Guest Editors to ascertain interest in such cases.

Submission Guidelines

Authors should refer to the submission rules specified in the “Information for Authors” section of the JSAC guidelines (www.jsac.ucsd.edu/Guidelines/info.html) to prepare their papers. Papers should be submitted through EDAS (<http://edas.info/newPaper.php?c=16921>).

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Important Dates

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