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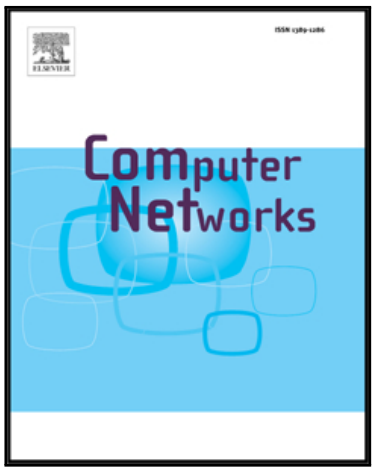

Area Formation and Content Assignment for LTE Broadcasting

Claudio Casetti, Carla-Fabiana Chiasserini, Francesco Malandrino, Carlo Borgiattino

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Area Formation and Content Assignment for LTE Broadcasting

Claudio Casetti[a], Carla-Fabiana Chiasserini[b], Francesco Malandrino[c,*], Carlo Borgiattino[d]

[a] *Politecnico di Torino, Torino, Italy*
[b] *Politecnico di Torino, Torino, Italy*
[c] *Politecnico di Torino, Torino, Italy*
[d] *Magneti Marelli, Milano, Italy*

Abstract

Broadcasting and multicasting services in LTE networks are shaping up to be an effective way to provide popular content. A key requirement is that cells are aggregated into areas where a tight time synchronization among transmissions is enforced, so as to broadcast the same radio resources. Our paper addresses a facet of LTE broadcasting that has so far received little attention: the creation of broadcasting areas and the assignment of content to them in order to efficiently exploit radio resources and satisfy user requests. Our original clustering approach, named Single-Content Fusion, achieves these goals by initially aggregating cells into single-content areas and maximizing cell similarity in content interests. Aggregated areas are then merged into multiple-content areas by virtue of similar spatial coverage. We show the validity of our solution pointing out the advantages it provides in comparison to other approaches. We also discuss the impact of various system factors (e.g., number of served users, broadcast data rate, area size) and the scalability of our proposal in large, realistic scenarios with both static and time-varying user interest.

Keywords: LTE-A, eMBMS, broadcast area formation, content selection, optimization.

*Francesco Malandrino is the corresponding author for this paper; email: francesco.malandrino@polito.it

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