

**Distance-based Inter-cell Interference  
Coordination in Small Cell Networks:  
Stochastic Geometry Modeling and  
Analysis**

# ABSTRACT

We propose a distance-based Inter-Cell Interference Coordination (ICIC) scheme in Small Cell Networks (SCNs). While most of the previous works focus on a randomly selected user called a typical user, we focus on an edge user because the main purpose of ICIC is to improve the performance of an edge user. Since there are many inactive Small cell Base Stations (SBSs) in SCNs, a simple criterion for an edge user such as being located near a cell boundary is not appropriate for SCNs. To accurately detect edge users experiencing severe performance degradation, we newly define an edge user in SCNs based on the nearest active neighbor SBS. We then apply our scheme only to edge users where SBSs within so-called the cooperation radius from each edge user cooperate. With the help of the stochastic geometry we obtain a semi-closed expression for the coverage probability of an edge user with our scheme. We investigate two trade-offs on the resource efficiency of a network and the coverage probability of an interior user. We then determine the optimal cooperation radius that maximizes the coverage probability of an edge user considering the two trade-offs. Our analytical results are validated through simulations.

# EXISTING SYSTEM

- In existing system, an inter-tier interference avoidance scheme in two tier cellular networks is analyzed where SBSs access macro cell spectrum using the cognitive radio technique.
- The main purpose of ICIC is to improve an edge user who experiences performance degradation due to inter-cell interference..
- Therefore, the performance of an ICIC scheme should be evaluated by the performance improvement of an edge user by ICIC.

# PROPOSED SYSTEM

- An edge user in SCNs is newly defined based on the nearest active neighbor SBS and a user-centric ICIC scheme, called the distance-based ICIC scheme, is proposed to provide guaranteed QoS to edge users in SCNs.
- A user-centric ICIC scheme using distance based cooperation to enhance the edge user performance in a network consisting of a number of small cells.
- Each small cell has one SBS and SBSs in the network are connected via a backhaul to exchange the information for interference coordination.

# SYSTEM REQUIREMENTS

## HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

## SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

# REFERENCE

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