



## Wireless Engineering Research and Education Center

### Modeling Vehicular Networks

**Yogesh Reddy Kondareddy**

Graduate Student, Department of Electrical and Computer Engineering  
Auburn University, Auburn, AL

#### Abstract

Random graphs have been studied extensively in literature. Dynamic random graphs which are assumed to be a good model of mobile ad-hoc networks such as vehicular networks have been comparatively less explored. But it is often vague to see that, nodes moving on a specific geographical model and a mobility model form a random graph.

In this talk we will start by formulating well-studied geographical, mobility, and communication model and show that these result in the spatial distribution of nodes (vehicles) being stationary, which, in turn, is used to prove that vehicles form a random graph  $G(n, p)$ , where  $p$  has a closed-form expression. We then extend this result to quite general geographical, mobility, and communication models, and still obtain a random graph  $G(n, p)$ , where  $p$  has an algorithmically computable expression. Thus one can measure and analyze properties of mobile ad-hoc or vehicular networks such as connectivity, broadcast time, and related security questions, as a function of basic communication, geographic and mobility parameters. As an application, we show how to investigate the security question, how much infrastructure is required to improve the connectivity and malicious user detection in the vehicular network.

#### Bio

Yogesh Reddy Kondareddy is a doctoral student in the Department of Electrical and Computer Engineering at Auburn University, Auburn, AL. He obtained his Masters Degree from the same University in 2008 and Bachelors degree in Electrical Engineering from Mahatma Gandhi Institute of Technology in 2006. Currently, he is a Research Assistant under Dr. Prathima Agrawal. His current areas of research are Cognitive Networks and Vehicular Networks.

**FRIDAY, SEPTEMBER 4, 2009, 3:00 P.M.**  
**235 BROUN HALL**