**Thesis:** SLA Evaluation And Composition In Reconfigurable Cloud Based Services

**Abstract:** Given the business mode of offering computing services to customers in a cloud setting, a major question arises: how good are the services of a cloud provider when compared to that of other providers? Furthermore, with the ubiquitous use of smartphones and tablets, how good is the cloud provider support for QoS and client mobility? My proposed research attempts to answer these questions by describing a methodology to evaluate the service-level agreements (SLA) between a cloud service provider and its consumers. Concomitant to these questions is the dynamic SLA composition under changes to the system's external environment: such as unexpected traffic surges, increased security threats, altered business models, etc. In one case, SLA evaluation may be based on run-time measurements of various cloud parameters (such as VM cycles and number of VM instances) and mapping them onto meaningful service-level attributes. The research goal is to provide a concrete definition of the service attributes experienced by the client application: such as availability, agility, elasticity, security, and mobility, in terms of the underlying cloud infrastructure parameters (i.e., VM instances and network bandwidth) and management policies (say, the statistical sharing of resources among client applications). The proposed research embarks on multiple facets of SLA management: (i) dynamic composition of SLAs; (ii) system measurements for SLA evaluation; and (iii) intelligent tools for system-level reconfiguration to accommodate diverse SLAs. The repertoire of system tools ranges from a declarative specification of SLAs to the software cybernetics mechanisms (e.g., model-checking) to orchestrate on-the-fly composition of SLAs based on the evolving needs of applications.

**Committee:**

- Professor Kaliappa Ravindran, Mentor, The City College
- Professor Jie Wei, The City College
- Professor Saptarshi Debroy, Hunter College

**Outside member:**

- Dr. Nakjung Choi, Bell Labs Nokia