# Foundational and Applied Research in Access Control

**Faculty:** Ninghui Li  
**Student:** Mahesh Tripunitara

## Administrative Models for Hierarchical RBAC
- **Problem:** Who is authorized to change state and how?  
- **Approach:** Administrative Permissions  
- **Practical Requirements:**  
  - Scale with users, roles  
  - Support arbitrary role hierarchies  
  - Lend itself to automation  
- **Security Analysis Requirements:**  
  - Tractable safety, availability  
  - Broad class of queries

## Fast Query Entailment in Hierarchical RBAC
- **Support for a broad class of queries**  
  - Access request  
  - Review Functions  
- **Support for efficient updates**  
  - Polynomial worst case time not good enough:  
    - Large state  
    - Decentralized storage  
- **Goal:** On average, constant time query answering and update  
- **Approach:** use modified Bloom Filter

## The Expressive Power of Access Control Models
- **Expressive Power based on reduction of security analysis**  
- **Access Control Model expressed as triple of states, transition rules and queries**

## Relating Access Control and Trust Management
- **Based on expressive power:**  
  - Reduction  
  - State matching reduction  
- **H-RBAC with user assignment reduced to RT0 without linking**
- **H-RBAC with user assignment and revocation reduced to RT0**
- **Complexity results for safety and availability for one apply to the other**