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AN HONORS UNIVERSITY IN MARYLAND

ebiquity group

ebiquity@umbc

- Part of the University of Maryland Baltimore County, one of three research campuses in the UM System
- "Building intelligent systems in open, heterogeneous, dynamic, distributed environments"

  mobile & pervasive computing, security/trust/privacy, semantic web, RFID, multiagent systems, advanced databases & high performance computing
- Core faculty: Tim Finin, Anupam Joshi, Yelena Yesha

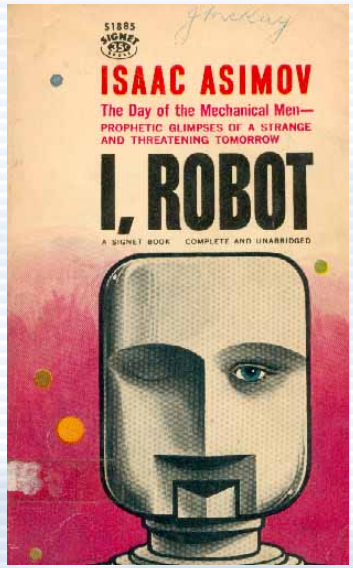
  Representing AI, Networking/Systems and Databases
- Students: ~10 PhD, ~10 MS, ~4 undergrads
- Partners and Funders:

  DARPA (DAML, Trauma Pod), NSF, NASA, NIST, …

  IBM, HP, Fujitsu, LMCO, Rockwell Collins …

Actionable Policies for Autonomic Systems

- We've developed Rei as a declarative policy language and used it to model and enforce policies in ad-hoc systems for
  - Authorization for services and information
  - Privacy in pervasive computing and the web
  - Information flow among agents and devices
  - Team formation, collaboration and maintenance
- Covers permissions, obligations, prohibitions, dispensations and sanctions
- Rei is supported by shared domain ontologies, rules and constraints expressed in RDF and OWL.
- Rei has been used to describe policies for trust and cooperative behavior in an ad hoc environment



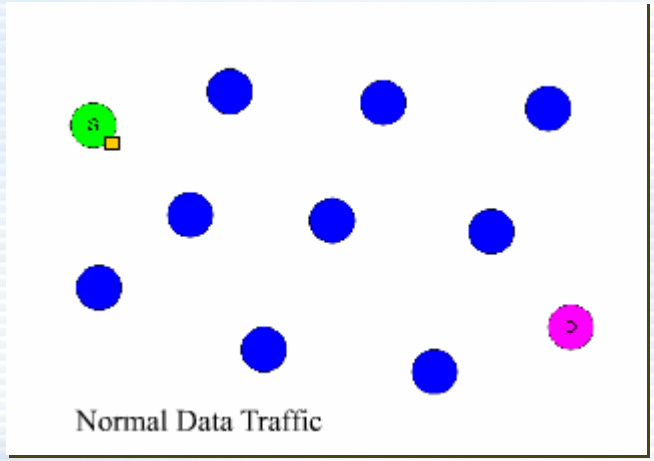
First policy for autonomic systems

Managing data and services in MANETs

- MoGATU/Anamika are data and service management modules for MANETs spanning application, transport & network layers
  - Functionality based on cross layer constructs
- Services/data described using OWL-S and SOUPA
  - Service invocation and composition, failure recovery
  - SPJ type data functionality, what is a transaction ?
- Devices send queries and requests to peers
  - Ask vicinity for reputation of untrusted peers that responded; trust a device if trusted before or if enough trusted peers trust it
- Use responses and answers from (recommended to be) trusted peers to determine correct response/answer
- Update reputation/trust level for all responding devices
  - Each device builds *a ring of trust*…

Recognizing cooperative behavior in MANETs

- Each agent recognizes good and bad behavior in their neighbors
  - Kudos and accusations are signed and shared
- Reputations emerge from the corroborated and unchallenged observations and opinions at multiple layers (PHY, MAC, NW, … App)
  - Uncorroborated or false reports are noted too!
- Agents use local policies, their own observations, and global reputation to make decisions
  - On communication, services, tasks, grouping, etc.



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