

## COMP 290 Midterm Exam

### Spring 2002

There are 4 questions; answer all of them. If you need to make an assumption to clarify a problem, *write your assumption down*. Only reasonable assumptions get full credit. *Explain all answers*. You have two hours to finish the exam. The questions are of varying difficulty; so it is probably advisable to answer the easier questions first to avoid getting stuck on the harder ones. *Good Luck!*

1. Name your favourite sub-area in ubiquitous computing. (1 pt)
2. Scope, Applications, and Issues (33 pts.)
  - (a) Give three features of a ubiquitous computing environment that you do not find in a traditional computing environment. (6pts.)
  - (b) Motivate the features in (a) by describing two classes of applications enabled by each feature and giving a concrete example of each class. (15pts.)
  - (c) Give two new research issues raised by each of the features in (a). (12pts)
3. Merging (33 pts.)
  - (a) Explain the problem of merging replicas. (5 pts.)
  - (b) Give two conflicting requirements an ideal merging infrastructure should satisfy. Explain why they are conflicting. (11 pts.)
  - (c) Describe three different approaches (e.g. Coda, Bayou, Sync) for addressing these requirements, and compare them based on how well they satisfy the requirements. (17 pts.)
4. Service Discovery (33 pts.)
  - (a) Explain the service discovery problem, identifying why traditional schemes such as DNS do not solve this problem. (7 pts.)
  - (b) Distinguish between push and pull based service discovery, explaining why systems such as UPnP support both. (8 pts.)
  - (c) Berkeley's SDS and MIT's INS both create multiple name servers to support service discovery. Describe and compare the interaction among the name servers in the two approaches. (18 pts.)