Abstract
We present our ideas of building a user-friendly conference assistant, using the existing wireless infrastructure at the University of Twente. Availability of such an infrastructure is a strong driving force for us to build useful applications upon it. We intend to provide basic services such as, (i) “Where Am I?”, (ii) Finding fellow attendants (without violating their privacy), (iii) Locating and finding resources and using them when needed (push-based services) and also providing services such as (iv) Notifying and Receiving Messages (pull-based services) in a smarter way.

Available Infrastructure

- Access Point (AP)
- Laptops
- PDA's
- Wireless LAN card

Localization Methodology
Positioning methods using WLAN can be taxonomized as below

- Cell of Origin
- Triangulation
- Finger printing
- TOA

We employ Model based-Signal Strength approach

- To reduce the calibration effort, we model ONLY the Access Point information
- Location computation done in two phases: Offline & Online
- It works by listening to the Access Points (AP) and looks up the information about the AP from the database which is collected in the offline phase
- There are two ways to compute the location:
  (i) Proximity technique
  (ii) Triangulation

Requirements & Challenges

- Location information should be maintained private, as it should not obstruct the privacy of the user
- Minimizing the calibration effort, so that the solution proposed is scalable
- Laptops with different operating system will be present, so it should be compatible with the use of heterogeneous platforms
- Conference attendees will be mobile, so location computation should be responsive
- Information available when the user is offline
- Clients should run SVG viewer

Conclusion

- We are presenting a privacy preserving decentralized architecture for providing location-based services
- Cost of deploying our system is negligible, as we are building it on top of the existing infrastructure and administration of the database is done as a part of University’s administration
- It is applicable to both indoors and outdoors with significant differences in the accuracy which is dependent on the density of the beacons
- No intensive calibration is required as our approach is based on the access point location only.
- Architecture presented can be further developed to provide more context-aware services

Graphical Interface

Floor maps of one of our buildings, Alice and Chris are shown online while Bob’s status is offline, his status reveals the time and location he was last seen