

# **RADAR: Indoor RF-Based Positioning**

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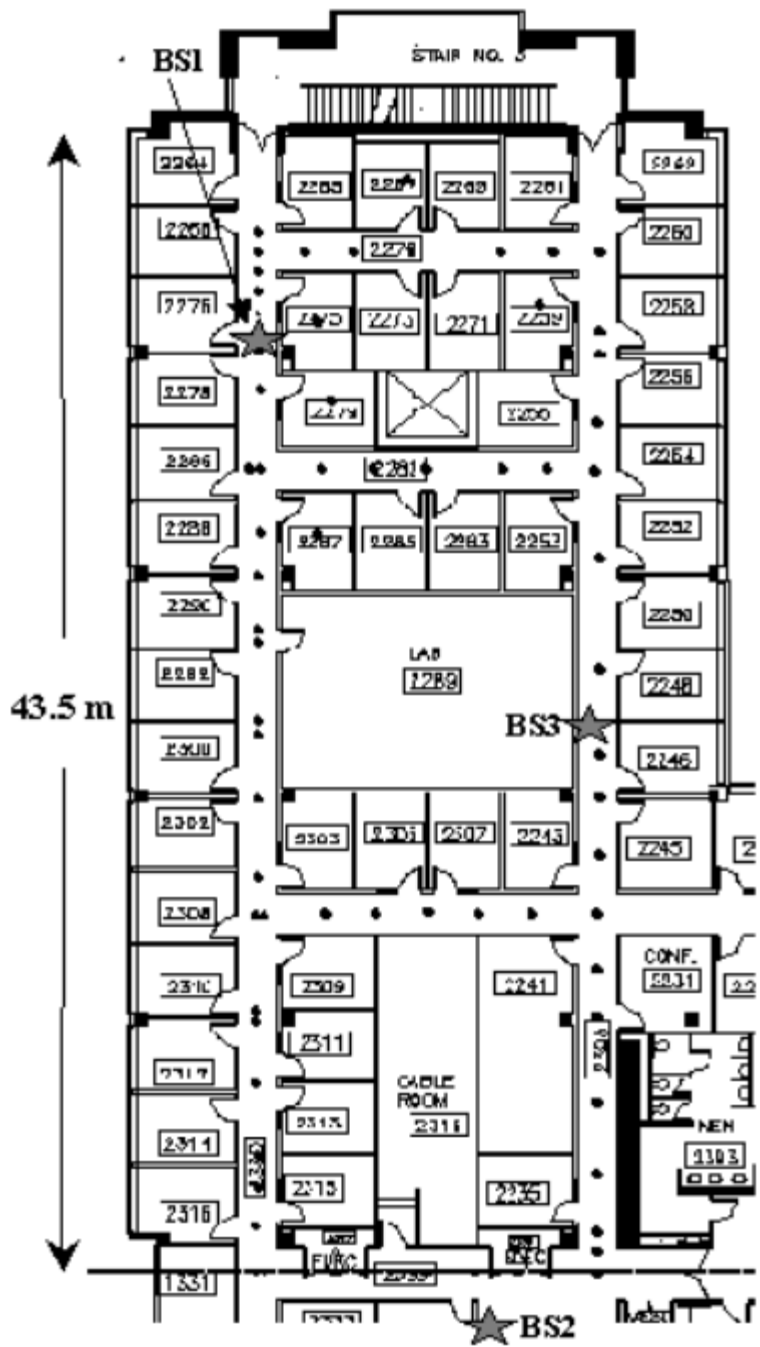
Microsoft Research

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Professors Balakrishnan & Adib

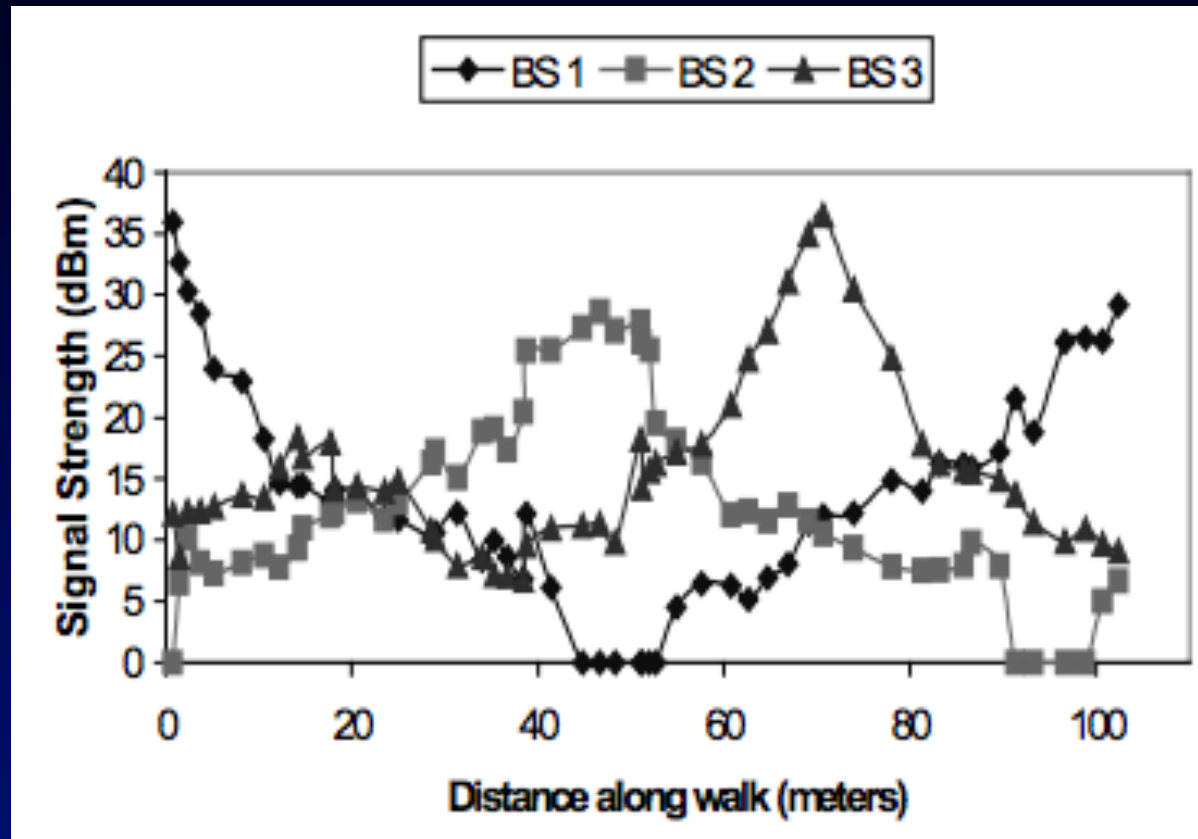
# Why are we reading this paper?

- First paper to propose using wireless LANs for indoor location estimation
- Measurement-based / analysis paper (not system)
- Key idea: RF fingerprinting
- Pioneering idea; with many enhancements it's a viable approach today in many settings

← 22.5 m →



# Signal strength at the base stations as user walks



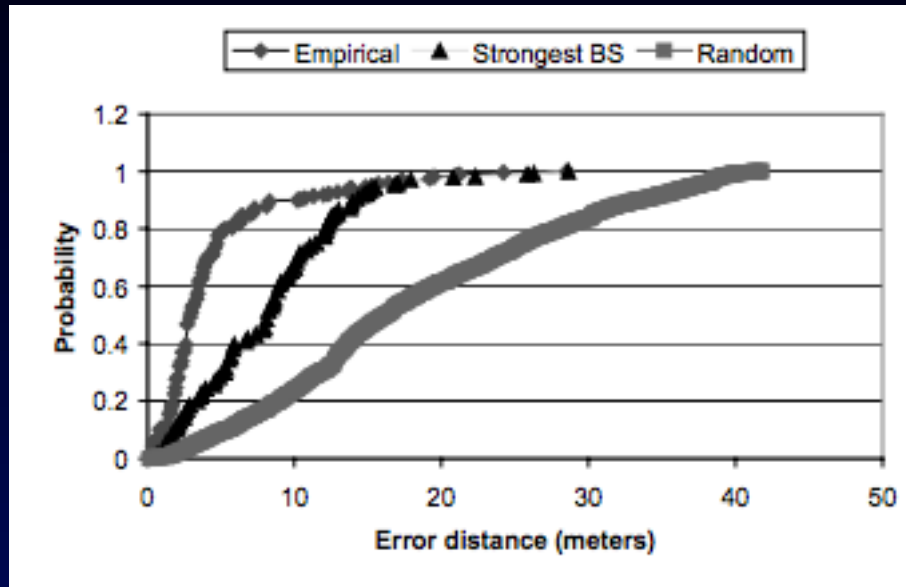
# Approach

- Summarize signal strength samples at base stations
- Metric for determining best match
- Determine “best match”

# Approach

- Summarize signal strength samples at base stations
  - Mean signal strength over a time window
- Determine “best match”
  - Empirical method
  - Signal propagation model
- Metric for determining best match
  - Nearest neighbor in signal space, i.e., Euclidean distance between  $ss'$  and  $ss$  vectors

# Evaluation



- Critiques

- Strongest BS is a weak strawman; random worse!
- Leave-out-one validation isn't as convincing
- (They also find that 70 measurement locations was over-determined for their location)