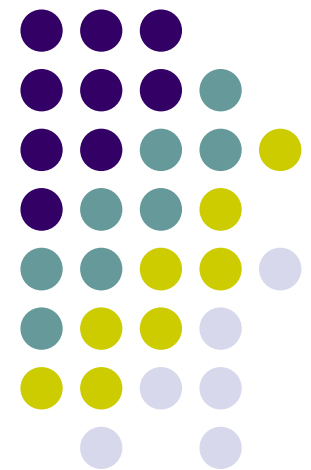


# Fusing Mobile, Sensor, and Social Data To Fully Enable Context-Aware Computing

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# Introduction



- Social networks like Twitter and Facebook are very popular
- Smartphones and mobile sensors are Ubiquitous as well
- Individually, each of these streams is not enough to provide rich contextual information
- Maybe we can combine the three streams

# Contributions



- Social Fusion
  - Collects and integrates diverse mobile, sensor, and social data
  - Uses collected data to infer context and offer recommendations

# Prior Work



- WhozThat
- CenceMe
- Serendipity
- These all address some portion of the problem



# System Overview

- Data is collected and organized into three classes
- Classifiers extract context from raw data
  - Context maybe individual or group
- Recommendation engine uses context to generate it's recommendations

# System Overview

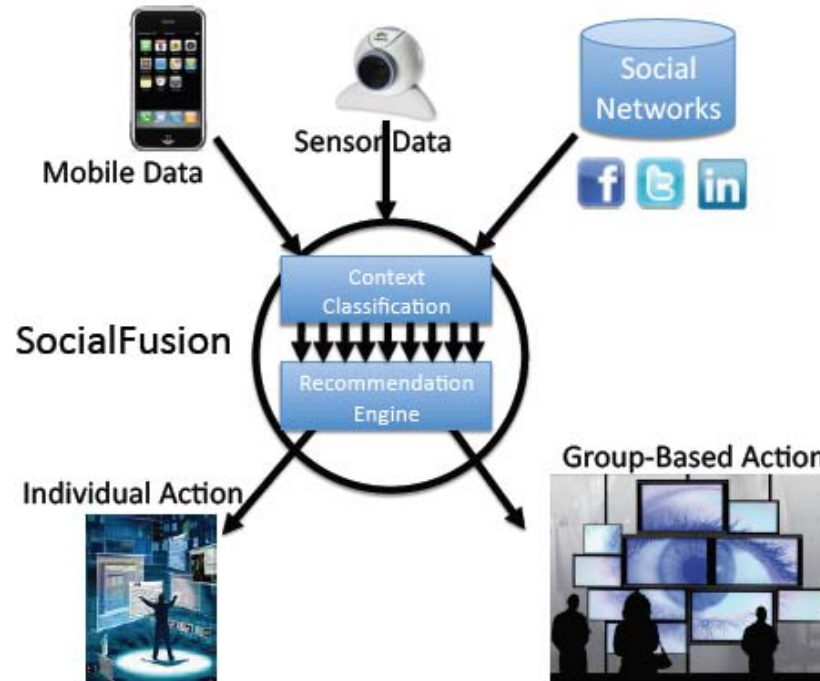
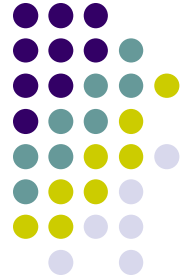


Figure 1: How SocialFusion fuses mobile, sensor, and social data to generate context awareness.



# Data Collection

- Power considerations while collecting mobile data
- Different sensor networks provide diverse APIs
- Social network data may be noisy
- Required to manage and organize terabytes worth of data in real time

# Individual and Group Recommendation



- Identify frequent patterns
  - Frequent itemsets - frequently co-occurring events
  - Frequent Sequences
- Frequent patterns are updated at run time with current data
- They are then used to generate the final recommendations





# Privacy

- Possible privacy leaks from revealing the recommendations publicly
- Traditional K-anonymity can not be achieved
- Define a relaxed version of K-anonymity
- Selectively withhold data to achieve this anonymity



# Experiment

- Implemented a movie trailer recommendation application
- Mobile (MC) and stationary component (SC)
- Mobile component implemented on emulator
  - Shares Facebook ID with SC via Bluetooth
- SC combines Facebook and Netflix data to make recommendations



# Limitations and Conclusions

- Used emulator for evaluation
  - Can't evaluate issues like battery usage
- Not much discussion on using sensor network data
- Privacy concerns a bit unrealistic
- Overall good conceptual paper that highlights the issues involved in combining multiple streams of data



## References

- *Fusing Mobile, Sensor, and Social Data To Fully Enable Context-Aware Computing* Aaron Beach et al, in Proc ACM Hotmobile 2010