



Gender-based Grouping of Mobile Student Societies

Men are from Mars and Women are from Venus !!

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Introduction

- Problem Statement:
 1. How can we classify users into groups based on gender, given publicly available traces ?
 2. Can we analyze User behavior and preferences using the above classification ?
- Our study is based on WLAN trace analysis*
- We present a systematic technique to group WLAN users. As a case study we applied it to gender.

* Available through MobiLib <http://nile.cise.ufl.edu/MobiLib>



Information in WLAN traces

MAC (anonymized)	AP associations	Start time	Duration
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Trace we used :

- Number of Users ~4000
- Trace Period = Feb 2006, Oct 2006, Feb 2007

Do not provide :-

- User information like name, gender, major.



Methodology

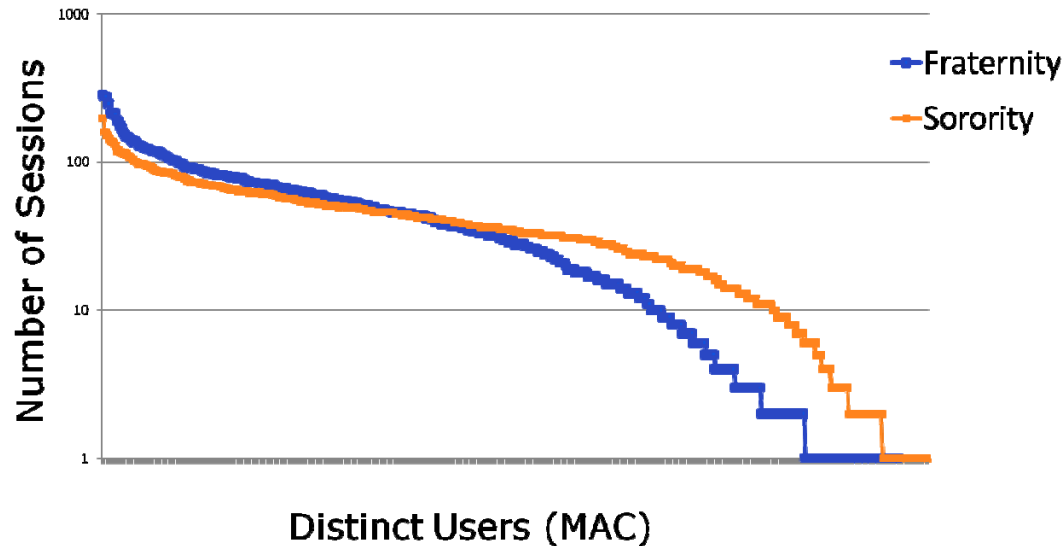
- How can we classify users in groups like major and gender?
- Males live in Fraternities
- Females live in Sororities





Methodology

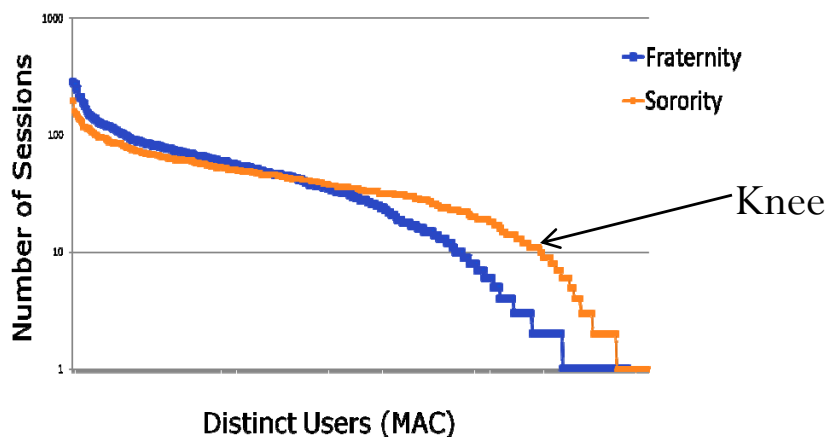
- How can we distinguish visitors from residents?
- Session of visitors would be significantly less than that of regular users.
- Exploiting this fact, we looked at the number of sessions and session duration per MAC





Thresholds

- In this graph the “Knee” bend is a important feature
- We classify those below the knee as visitors and exclude them from further studies. (order of magnitude difference in sessions)



Feb 2006	No. of Males	No. of Females
Before filtering	777	687
After filtering	452	463

- Similar trend is seen in other trace samples as well



Requirements

- Suitable traces (from university campus) should provide
 - Comprehensive logs for all buildings, dorm, fraternity/sorority
 - Mapping between AP to buildings
 - Ability to differentiate between individual users
 - Ability to track users for the whole duration of the trace.
- Similar analysis can be done for urban traces, if we can find out places or locations which are inherently preferred more by male over females or vice-versa.

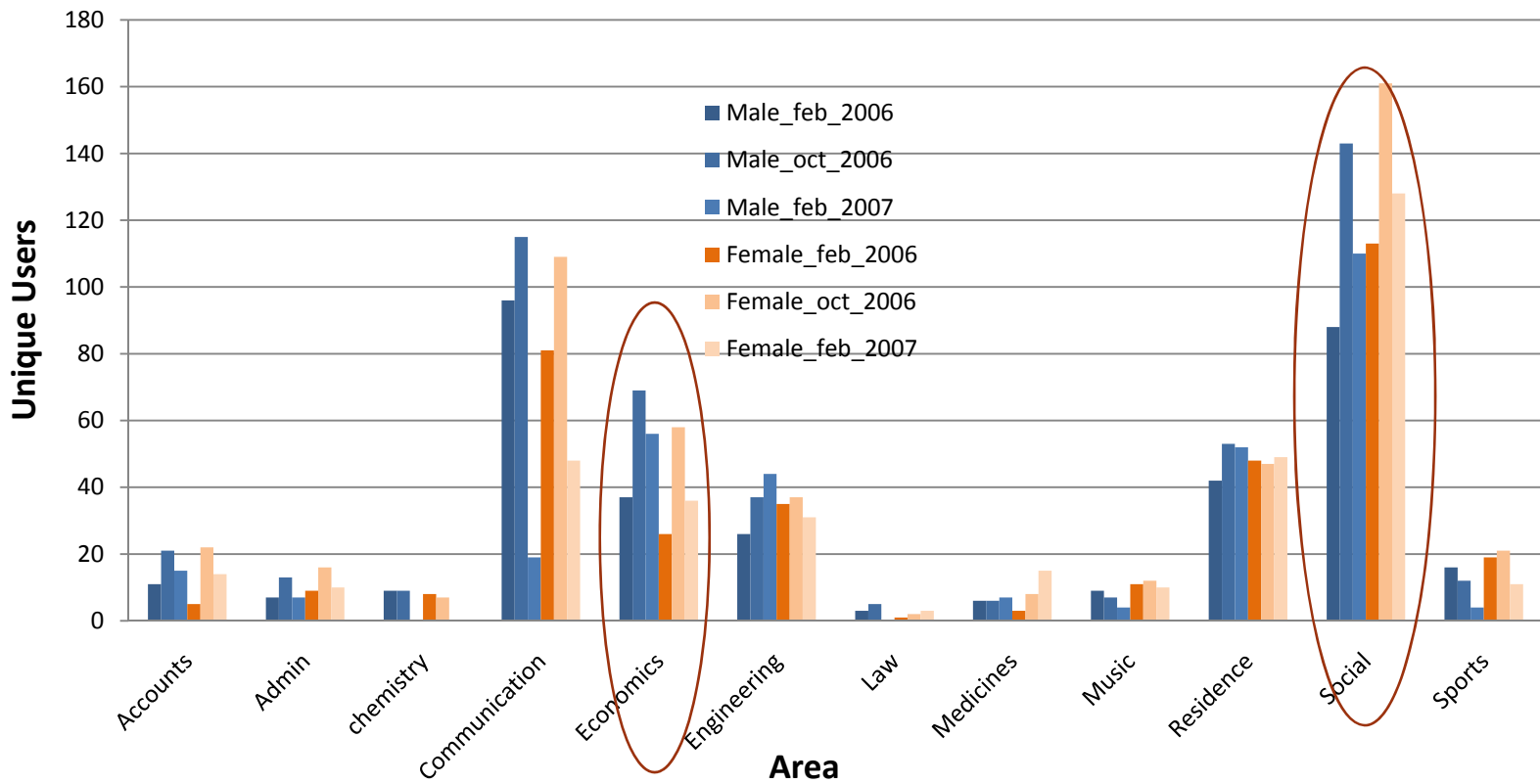


Using this info

- Problem Statement:
 1. How can we classify users into groups based on gender, given publicly available traces ?
 2. Can we analyze User behavior and preferences using the above classification ?
- We analyze the traces with the following metrics
 1. Major (Buildings most frequented)
 2. Online activity (Session duration)
 3. Device preference (Apple or PC 😊)



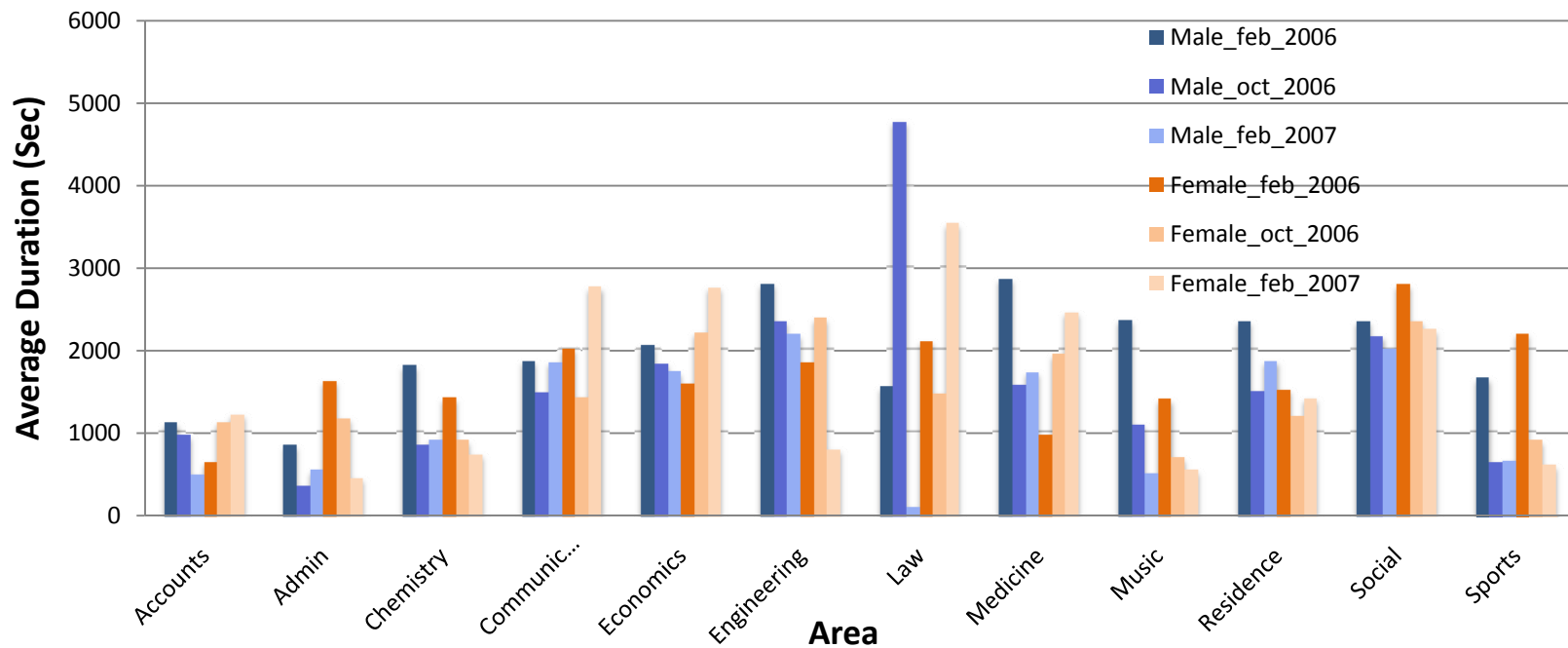
WLAN User Distribution





Average session duration

- Are there trends in the average online times of users ?

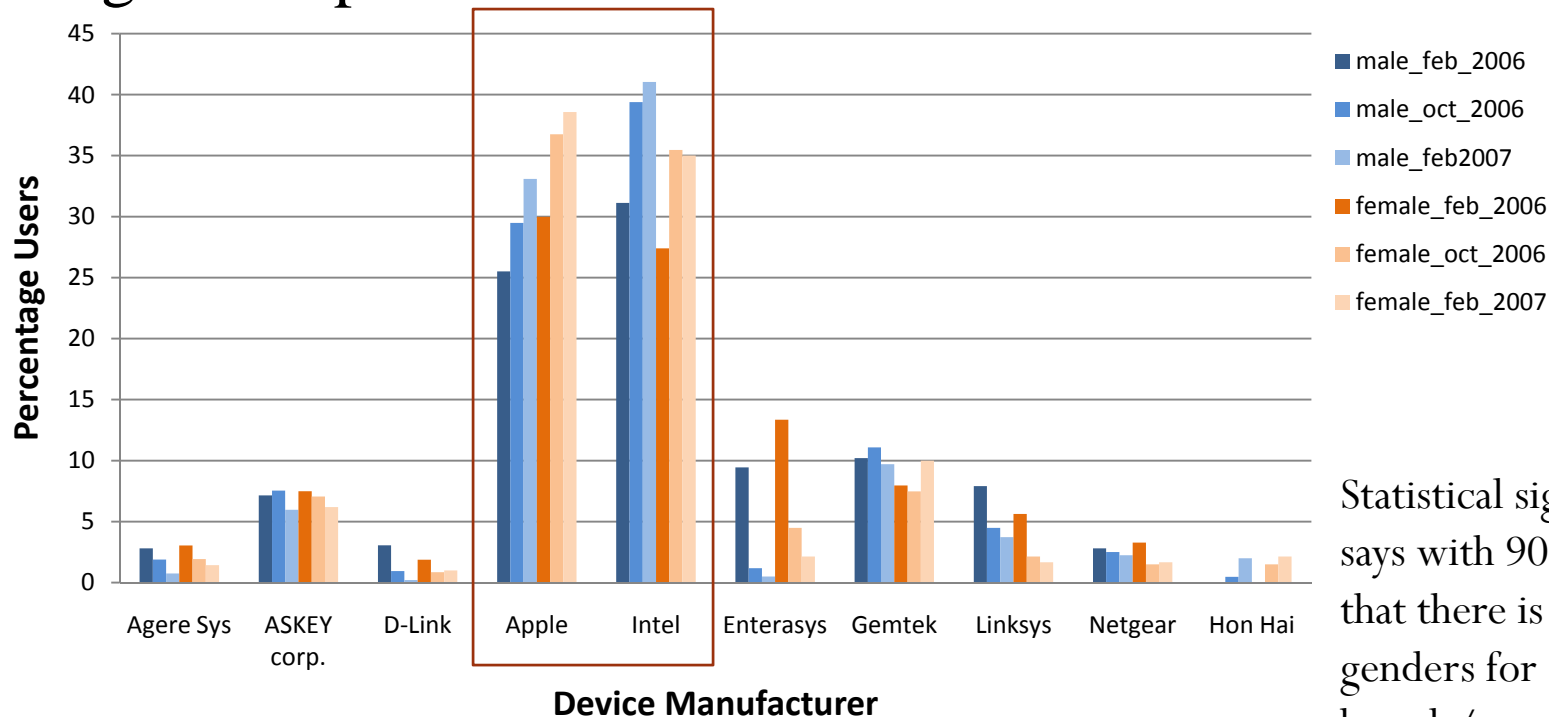


- Females have more online time than male WLAN users.



Preference

- Device preferences: Which device vendors do different genders prefer?



Statistical significance test says with 90% confidence that there is bias within genders for brands/vendors

- Females seem to prefer Apple over Intel



What can we do with it ? (Applications)

- Profiling : identify gender, preference, major for a user
- Social Science: extent of WLAN adoption amongst genders can point out socio-economic and socio-cultural gaps between genders.
- Directed Ads: target announcements can be directed based on the general psyche of males and females. The areas these users frequent more could serve as good places to advertise related interests, services or products.
- Application Customization: Based on preference of the genders
- Designing network protocols for DTN (Delay Tolerant Networks)



What now ? (Future Work)

- Further trace analysis
 - Samples from other campuses (on-going)
- Classify users on other metrics
- Issues
 - Can we know the ground truth?
 - More samples of which we have ground truth
 - What about Privacy?
(research about K Anonymity)



Thanks !!

- Questions ??
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: <http://nile.cise.ufl.edu/MobiLib/>
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