Statistics Project Proposal

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Simulation of Interactions on Campus

You are sitting in Free Speech Movement cafe. Random people come and go every day, all different but carrying the same textbook. Wait, is this just a coincidence?

People on the university campus, especially students, tend to follow certain routes. Such routes mainly depend on the major courses schedules. In this project, I plan to build a simulation model of interactions between students on the campus.

The simulation process takes place as follows:

1. Simplify the main routes on campus into a subway map.
2. Time frame will be t={0, 1, ..., T} where t=0, T indicates 8 am, 5 pm respectively.
3. Categorize students into six groups: male/female Statistics major, male/female Mechanical Engineering major, male/female Business major.
4. The probabilities of each movement of each major/gender are calculated through their general class schedules.
5. With such calculated probabilities, random walk process begins.
6. The starting point at t=0 for each student: their department main building.
7. Mark the interaction points where students are at same location at same time.
8. Through bootstrap process, generalize the interactions between students on campus. (e.g. Generalizing the location of interaction between Male Stat major and Female Business major.

Example.

At time t=0, female Business major student ABC starts at Haas.
At time t=1, P(ABC goes to East Wurster) = 0.3
At time t=1, P(ABC stays at Haas) = 0.25
At time t=1, P(ABC goes to Eye Center) = 0.25
At time t=1, P(ABC goes to WFC) = 0.1
At time t=1, P(ABC goes to Maxwell Field) = 0.1