One of the primary goals of attending academic conferences is professional networking, yet even though this interaction can increase one's feeling of community within the field, conference attendees are not interacting as much as they could be. Similarly, it's known that students who do not feel as if they are part of a larger academic community are less likely to participate in extracurricular activities and organizations, lowering retention rates. To combat both of these problems, we present SNAG (Social Networking and Games). SNAG is a suite of mobile and Internet games which aim to facilitate social networking between members of a group, and can be used in either a conference setting or within a university. This abstract focuses on one specific game, Snag'em, and discusses our planned evaluation for our SNAG games.

**Keywords**
Games, Social Networking

**ACM Classification Keywords**
Introduction
Communities are defined as a result of interaction and deliberation by people brought together by similar interests and common goals [11]. These interactions, though, do not always create a community that is representative of all members. Certain factors such as level of extroversion, position within the community, and even native language can cause social inequality between all members of the group, influencing the growth of the community [5]. In a conference setting, this can impact the way individuals interact with one another and be detrimental to overall conference success. A few academic institutions have created technological responses to this unfortunate problem [3, 5, 6, 9], though little work has been done to systematically evaluate these techniques.

In an academic setting, a sense of community has a strong positive correlation with retention. This effect is particularly important in math and the sciences, where minority students suffer without a strong student support group [8]. A feeling of community can be nurtured with small group activities that augment the individual’s role within a setting and helps students to foster connections [7]. Creating an educational community that specifically fosters student interaction significantly increases both success and retention rates [1, 7]. This emphasis on collaborative learning is vital, with Wegener once noting that “without a feeling of community, people are on their own, likely to be anxious, defensive, and unwilling to take the risks involved in learning” [10].

Unfortunately, social interaction among students does not just happen; rather, it must be intentionally designed into the course structure to produce the intended results [7]. Regardless of the benefits, however, social interaction is not yet strongly supported in most university classes, and many professors do not integrate existing social networking sites into their assignments. There are a few possible reasons for this, including professors trying to encourage social interaction, but being unsure of the proper way to approach the problem [2, 4]. Of course, encouraging student socialization is not universal; some professors do not believe that networking will significantly benefit their students, or may not have enough time to designing environments to promote interaction. We are targeting this problem by creating a collection of social networking games to support community building in a university or department instead of into a particular class.

The SNAG project involves a team of 11, including 8 women, 2 African Americans, 2 faculty, 3 graduate students, and 5 undergraduates. Students are extremely enthusiastic to be involved in integrating mobile technologies with pervasive games and social networking technologies, and we believe this interest indicates the potential for SNAG to engage a broader population in computing and research.

SNAG Games Suite
The SNAG games suite will consist of a wide variety of games to facilitate social interaction. While some games will only involve two people, other SNAG games will incorporate each of the members in the community all playing at the same time.
All games will be downloadable applications for smart phones or can be played through SMS texting, though some games will also be accessible over the Internet. For example, players can sign into the SNAG site at any time to view their contacts. We chose to develop mobile phone applications because it allows players to engage “in the moment." We believe that this design choice will allow us to assess how people use games to interact with people on an ad hoc basis, even though we acknowledge that it may limit who will be able to play. SNAG games will each focus on a different type of social interaction to support the variety of goals that diverse players may have for social networking. The games fall into three main categories: one-on-one, few-on-few, and many-on-many. These interactions all differ in the quantity of people playing at a time and the quality, or depth, of the information a game should help bring out.

Snag’em
Snag’em is a large group networking game that is essentially a human scavenger hunt. Snag’em was developed in PHP, providing a web-based front-end which allows players to create their online profile and forge connections with other users. In this social networking game, players create a list of facts about themselves, called tags, which are then randomly presented to other players as missions. Missions are presented in the format, "SNAG someone who works in the Games and Learning lab," and can only be completed by interacting with a person who fit this qualification. Most of the game’s interactions are enabled by our MySQL flexible database design, which allows new types of tags to be integrated into the game seamlessly. This game can easily be deployed in either a conference or university, which makes it very representative of the other games in the SNAG suite. This is our first SNAG game to begin to be formally evaluated, and we have seen very promising results from preliminary play testing.

Game Play and Mechanics
The first thing new users do in Snag’em is create a profile, with tags and a virtual avatar. The game randomly generates five missions and the user can choose the one that best fits the type of person they want to meet. Players “snag” other players who meet the mission criteria, which are sets of tags, by entering their 4-digit SnagID. This ID can be texted in or entered using a browser. To dissuade cheating by entering in random ID numbers, points are deducted for incorrect answers. This also helps to encourage more substantial conversations with an individual, because it motivates the player to make sure the
person does, in fact, have the trait they need to locate. Difficulty, in this case, is defined by the probability of people in the community who associate with a given tag. More points are awarded for more difficult missions. To ensure these quests are neither too easy nor too tedious, missions will only be generated when 10% - 90% of players fit the given qualification. When the player has achieved their mission, they can generate a new list of quests and play again.

In addition to single snag missions, players can also play event missions. Community events, which players and moderators can add to the Snag'em website, appear as missions, and players can “accept” them by RSVPing that they will attend. Later at the event, a code will be announced and attendees will be able to enter in the code to receive points for their RSVP. If players RSVP and do not attend, points will be deducted from their overall score. As a reward for going to these events, we provide the player with in-game prizes such as new avatar customizations or “forfeit mission” coupons which allow players to forfeit missions without a point penalty. Encouraging students to attend community events is an important aspect of Snag'em’s influence on retention.

Network Connectivity
One of the most notable aspects of Snag'em is that it encourages player’s to build a cohesive, strong network by offering connectivity bonuses that boost how many points are earned per snag. When two people have snagged each other for a mission, the connection between these two people is mutual and they are referred to as friends. When snags are not mutual, a weak connection is created between the two players. By rewarding more points for more complete networks, we encourage players to help their friends in order to form more valuable social groups. We are designing a visualization of players’ social networks, ranging from their direct snags to information about friends-of-friends. With this, user can form a cohesive idea about who they've been able to find for missions, and where their strongest connections lie. We will use color and thickness to portray information about the network back to the user. For example, strong connections are formed when there are mutual snags among a group of people, and will be denoted with darker and thicker lines. We will also show users groups where they are forming strong and weak relationships, to promote players to engage with more groups. Higher bonuses are given when a player snags a person outside of their usual networks. This system encourages players to interact with people from different groups, while also promoting regularity in these interactions to build strong connections. Currently, we only have a text-based version of the user’s network.

Evaluation
We performed a pilot study on two of our SNAG games at the STARS Celebration 2009. Eighty of 280 attendees (28%) played Snag'em over the course of three days. Of those participants, 40 players (50%) successfully scored points in the game and 28 (35%) completed two or more missions in game. Player activity, we found, was consistent throughout the conference, with players playing at all hours of the day from as early as 8:30am to as late as 10:00pm, even though conference sessions usually ended at 6:30pm. We were also surprised when players would immediately resume game play after the game occasionally went down. The game suffered from several hacking attempts (with players giving
themselves many points and attempting to destroy parts of the database) as well as two server shutdowns. The game, however, maintained its popularity throughout the conference. Despite the game’s vulnerabilities, Snag’em received positive feedback, and several of the moderators observed the players as being among the most gregarious attendees at the conference. Many players indicated that their favorite feature of the game was meeting new people. The game gained enough popularity that Spellman College asked for a copy of the game for use during a week-long event the following semester. Although these results are anecdotal, we are encouraged by the findings and will conduct formal evaluations with the game at our university in Spring 2010.

Our smaller SNAG game called TableTilt inspired people to play when they watched small groups of conference attendees cheering one another on as they worked together to roll a set of balls into several targets spread across two to six iPhones and iPods. Because of limited resources, we recorded data for only 36 players, but quite a few more attendees played and gave positive feedback, stating they would download the game from the iPhone App Store.

We plan to conduct formal studies on TableTilt, Snag’em, and future SNAG games as we develop them. In particular, we plan to evaluate Snag’em for computer science students and faculty in Spring 2010. Our hypothesis is that the game will encourage computing students, and particularly undergraduates, to engage in our community. To test this hypothesis, we plan to conduct a pre-post test study to determine engagement in our computing community, paired with measures of gameplay and usage of the Snag’em website. We will survey students about their level of engagement and interaction with faculty and other students, particularly for study groups and office hours. We will measure participation in extracurricular activities such as the ACM and other computing student organizations. Survey measures will include positive/negative affect, Likert scale items and free response questions. We also plan to measure how effective they are at fostering relationships that last after game play has ended. We will examine how SNAG games are used as icebreakers, and if people use their saved contacts to build stronger and more permanent relationships. This information will help us understand what criteria best facilitate interactions between people in a university or at a conference.

Discussion
The SNAG games suite has two main goals: to provide students with fun ways to naturally augment their social networking with people in their community and to assess how different types of game-based social facilitation tools are used. There has been a foundation of research which states that a strong community can increase the retention rates of students, particularly minorities, in computer science, though there has been no work evaluating how we can use mobile social networking games to foster the growth of a strong network of people. Each SNAG game will be evaluated separately to examine individual effectiveness in regards to its fun, ability to motivate and facilitate conversations, ease of use, and, for some games, how extended use over the semester affected the players’ feeling of belonging within the community they were playing with. We will also evaluate the games as a whole, assessing which people found which games to
be most beneficial to help us identify design principles for social networking games.

The Snag' em project is already working to promote broader participation in computing research for its developers, most of whom were women and minorities involved in an undergraduate research experiences in summer and fall 2009. It is important to build community in science and math departments and at academic conferences to broaden the participation of women and underrepresented minorities in these vital fields. Addressing the different social interaction styles of diverse groups may help increase a sense of belonging for those who feel different in a field, and remove the barriers to their continued participation. We are committed to designing social networking games based on research on communities of practice and broadening participation, and conducting rigorous scientific evaluations of our games.

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References