

Why Checkins: Exploring User Motivation on Location Based Social Networks

Fengjiao Wang¹ Guan Wang¹ Philip S. Yu^{1,2}

¹Department of Computer Science, University of Illinois at Chicago

²Computer Science Department , King Abdulaziz University

Highlights

- Idea
 - Predict checkin motivation in Location-based social networks
 - Co-checkin analysis of Gowalla Data to help predict motivation
- Model
 - Inspired by social psychology model, we propose user checkin motivation prediction model (UCMP)

Outline

- Motivation
- Co-checkin analysis of gowalla data
- Model
- Experiment
- Conclusion

Location-based social network

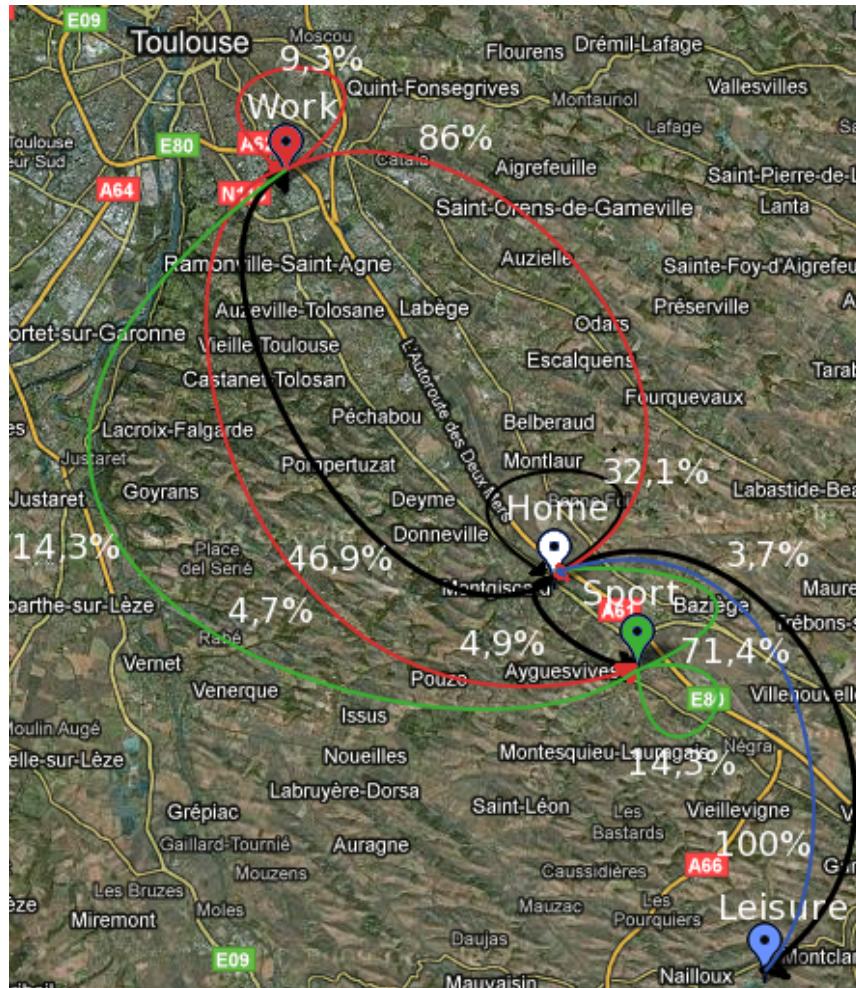


The left screenshot shows the Foursquare app at 11:31 AM with the "RECENT" tab selected. It displays check-ins from four users over the last three hours:

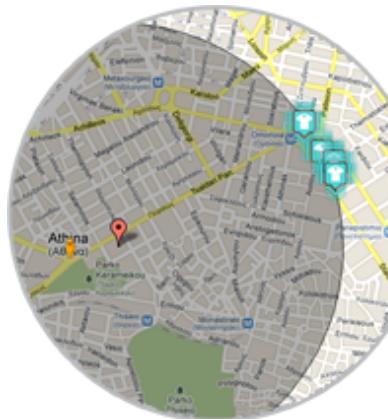
- Sean S. @ Mono+Mono: Celebrating! (2 hours ago)
- Tristan W. @ Energy Kitchen: 71 Nassau St (2 hours ago)
- Mari S. @ Newark Liberty Internatio...: Tokyo bound (2 hours ago)
- Naveen S. @ Colors Restaurant: 417 Lafayette St (2 hours ago)

The right screenshot shows the Foursquare app at 3:46 PM. It features a "SPECIAL NEARBY" section for "New York Penn Station" (7th Ave (btw 31st St & 33rd St)) with a large green "CHECK IN HERE" button. It also shows information about Douglas G., who is the mayor, and a list of 2 friends and 68 other people who are here, along with a row of small profile pictures. Other sections include "3 tips from friends" (185 left by other people) and "More info" (Map, contact & more). The bottom navigation bar includes icons for Friends, Places, Explore, To-Do List, and Matt.

Location prediction



Location-based advertisement

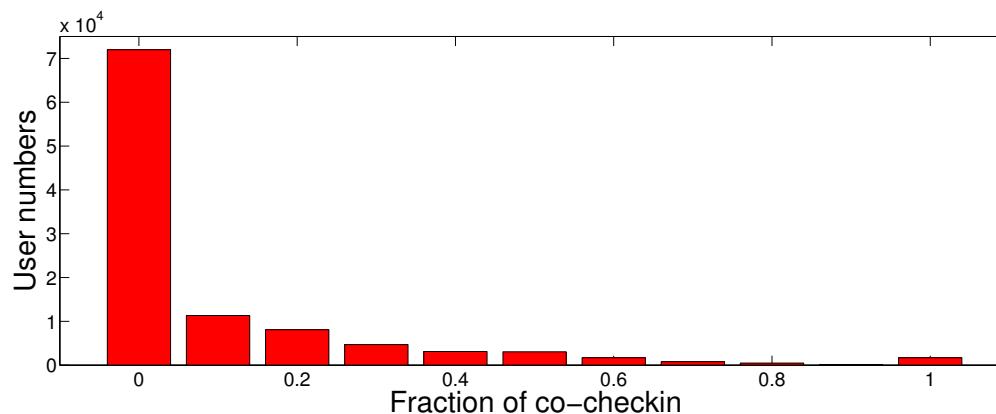


Gowalla Dataset

- 196,591 users
- 950,327 friend links
- 6,442,890 checkins (from Feb 2009 to Oct 2010)
- 30367 location information

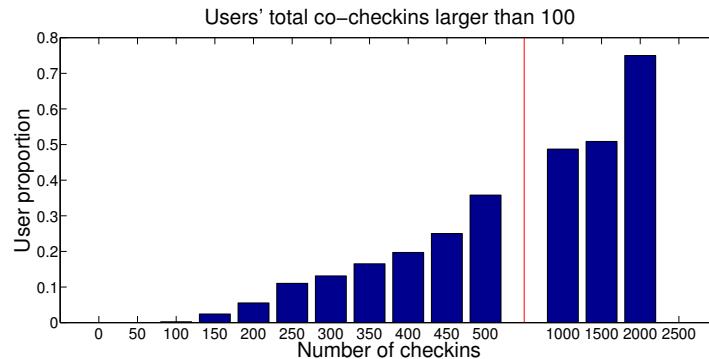
Co-checkin analysis of Gowalla Dataset

- Co-checkin
 - User and his friend check in at the same location within a short period

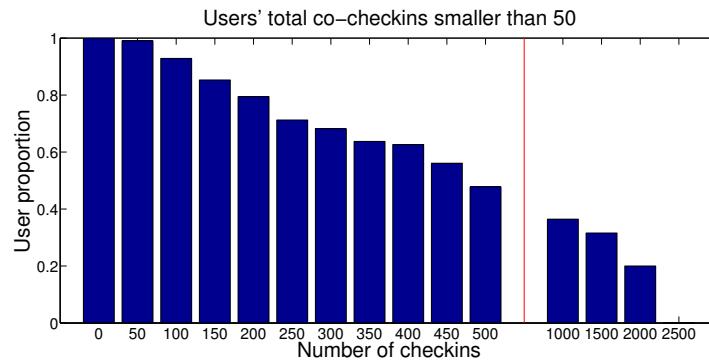


(a) statistics of co-checkin information

Co-checkin analysis of Gowalla Dataset

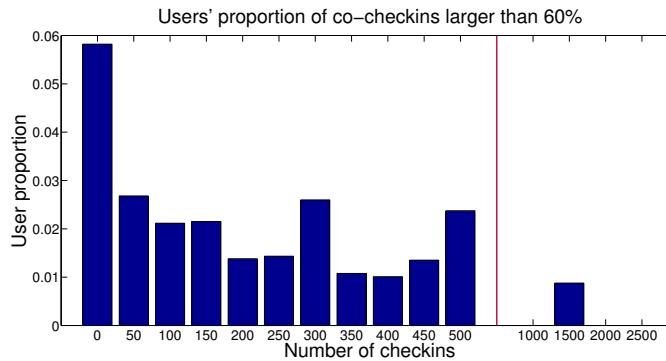


(b) total co-checkin larger than 100

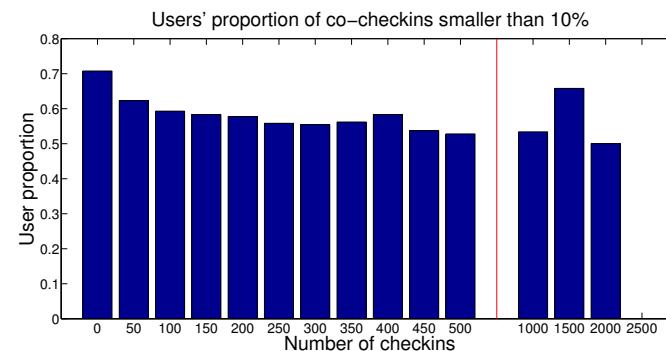


(e) total co-checkin smaller than 50

Co-checkin analysis of Gowalla Dataset



(c) co-checkin percentage larger than 60%



(f) co-checkin percentage smaller than 10%

Social psychology model

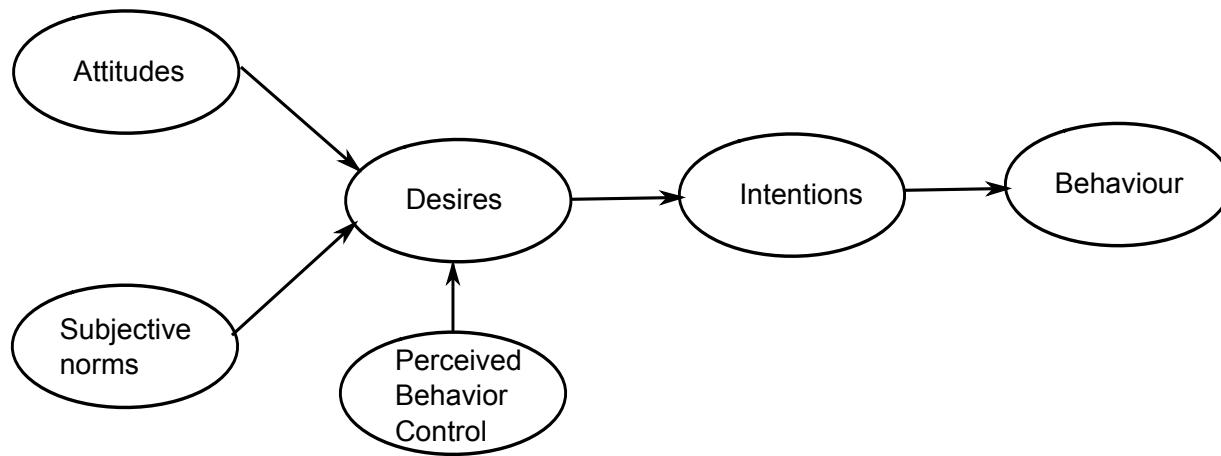


Fig. 2: Simplified model of goal-directed behavior

User checkin motivation prediction model

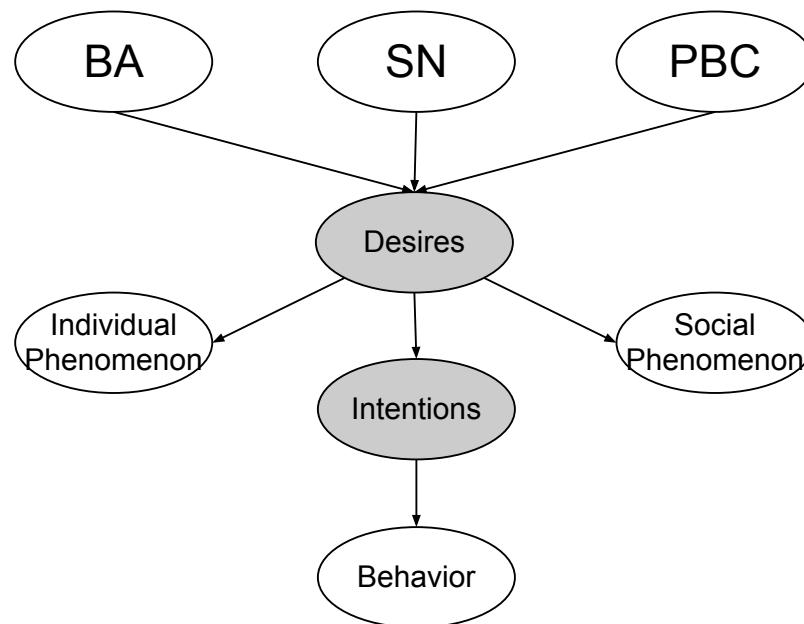


Fig. 3: Prototype of UCMP model

Experiment – Case study 1

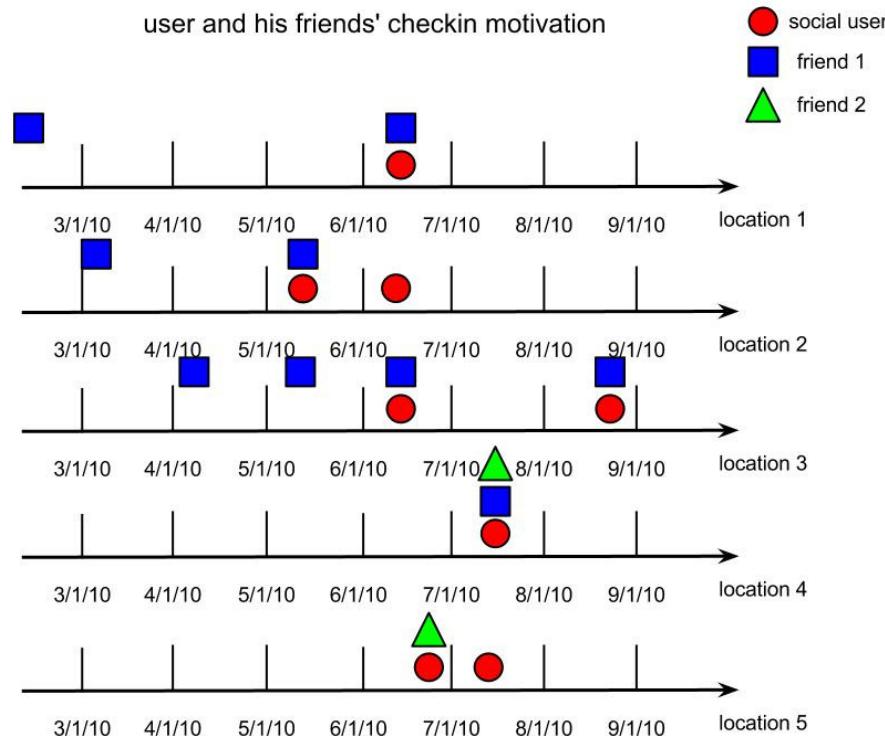


Fig. 4: User and his friends' checkin motivation

Experiment – Case study 2



Fig. 5: Case Study - Location

Experiment – Motivation prediction

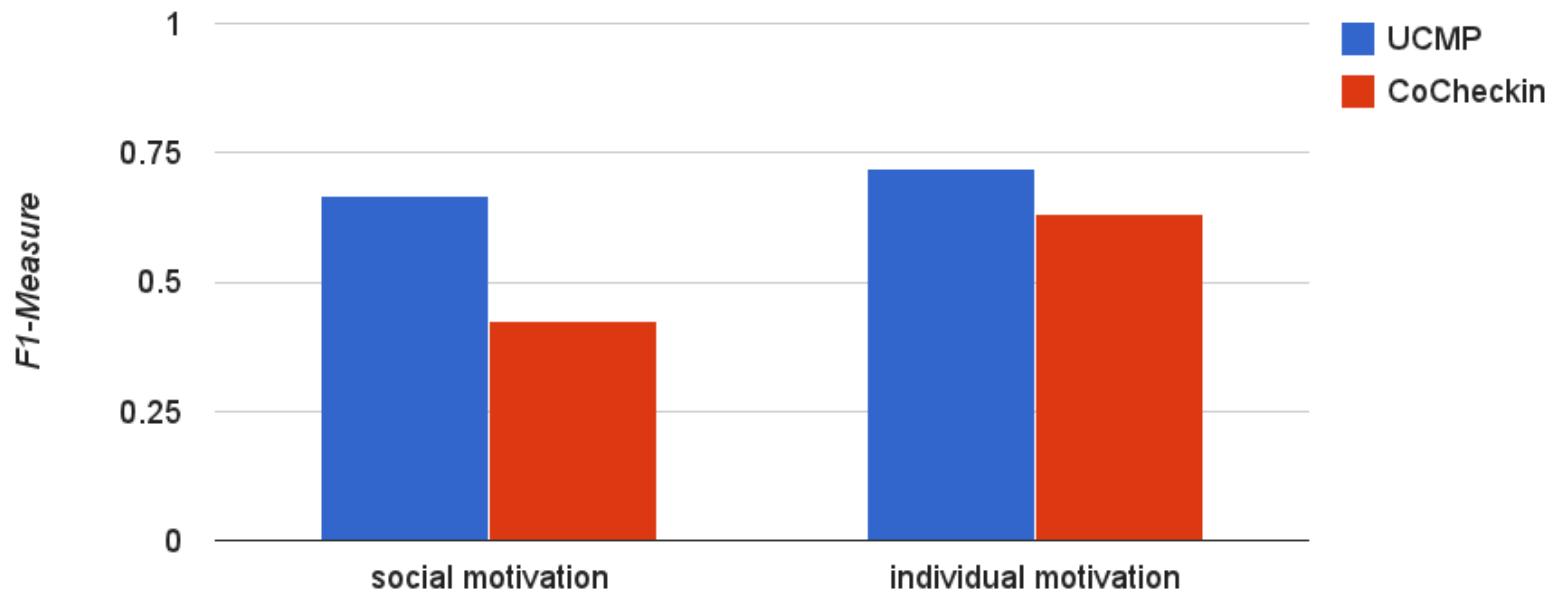


Fig. 6: Experiment Result

Experiment – Observation

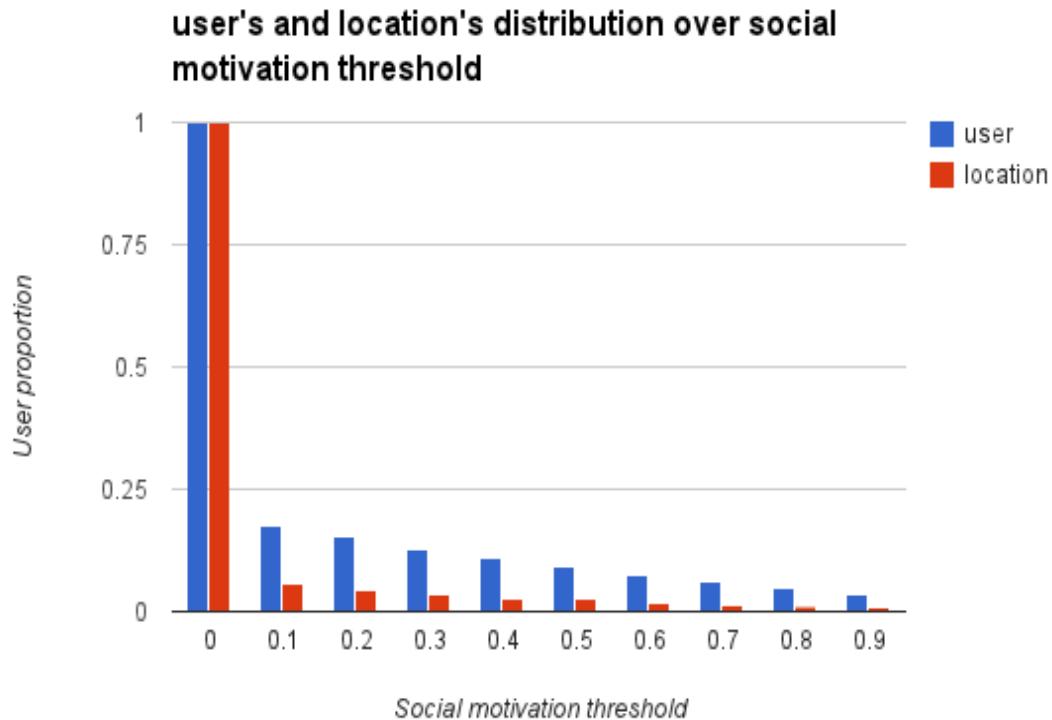


Fig. 7: user's and location's distribution over percent of social motivation

Experiment – Prediction Tasks(1)

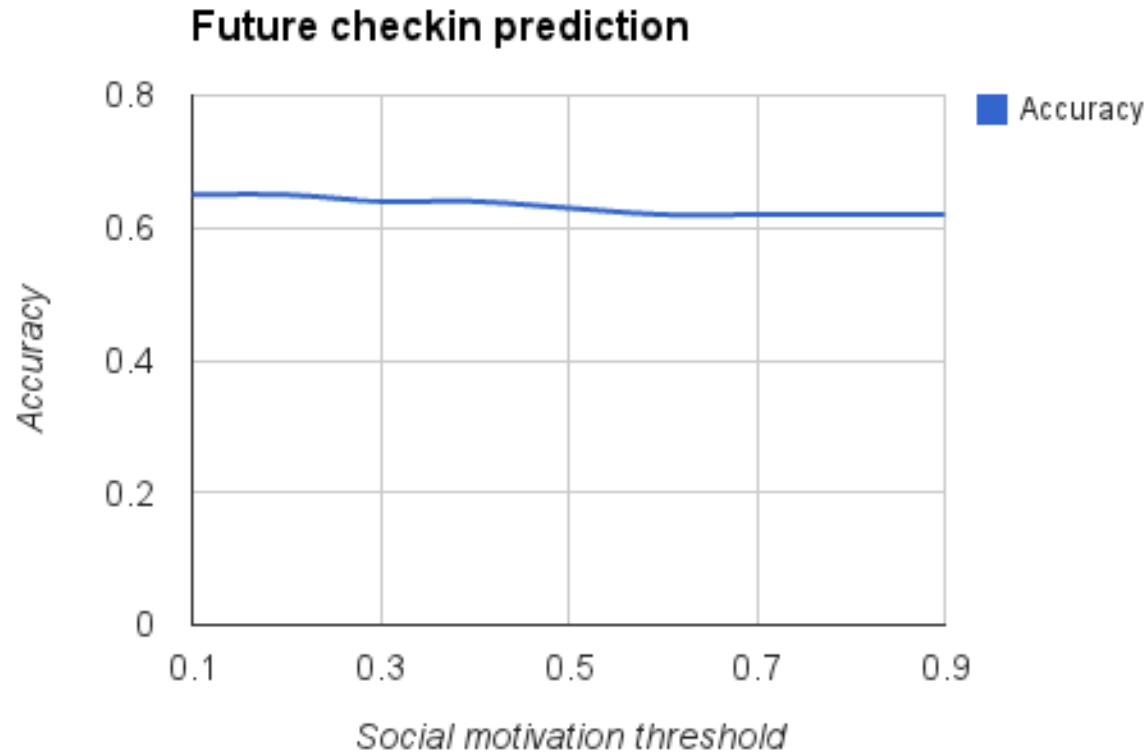


Fig. 8: prediction accuracy of user's future checkin

Experiment – Prediction Tasks(2)

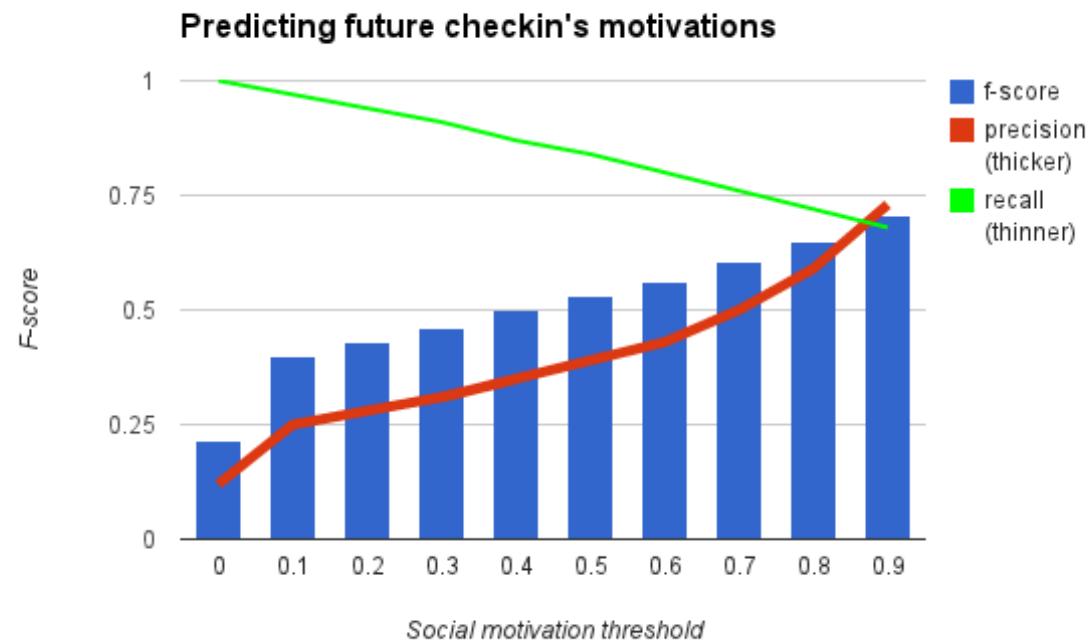


Fig. 9: precision, recall, F-score of future cocheckin prediction

Conclusion

- Design computational motivation prediction model to predict checkin motivation.
- Differentiate socially motivated and individually motivated checkin to help predict future checkin or increase the effect of location-based advertisement

Thank you!