

MovieGoer – Semantic Social Recommendations and Personalised Location-Based Offers

Andreas Thalhammer¹, Timofey Ermilov², Katariina Nyberg³, Ario Santoso⁴,
and John Domingue⁵

¹ STI, Universität Innsbruck, Austria, firstname.lastname@sti2.at

² AKSW, IfI, Universität Leipzig, Germany, lastname@informatik.uni-leipzig.de

³ SeCo, Mediatech, SCI, Aalto University, Finland, firstname.lastname@aalto.fi

⁴ Faculty of CS, Free University of Bozen-Bolzano, Italy,
firstname.lastname@stud-inf.unibz.it, supported by the European Master's
Program in Computational Logic (EMCL)

⁵ Knowledge Media Institute, The Open University, J.B.Domingue@open.ac.uk

Abstract. MovieGoer is an application designed for portable devices that provides its users with context-based services on movie schedule information. It uses social networks, such as Facebook, to replace a user's effort to enter preferences and personal data explicitly. It gives personalised recommendations on new movies and allows the users to interact with friends sharing the same movie taste. In addition, it enables new business models by connecting cinemas and other service providers with customers. The data integration for all the above is done using specific data sets and schemas from the Linked Open Data cloud.

Keywords: linked data, LOD, recommender system, location-based services, mobile application, ontology, social, semantic web

1 Semantic Showtime Information and Social Recommendations

MovieGoer provides the users with showtime information for movies for a specified time in cinemas in either their current or some other location. The information on the movies shown are gathered from specific data sets, Freebase⁶ and DBPedia⁷, from the Linked Open Data (LOD) cloud⁸.

The system allows users to log-in via Facebook (FB) and uses the information of the profiles (e.g. favorite movies, actors, or directors) to build its movie recommender system. MovieGoer does not only recommend movies that the user might like and that are shown nearby, but also suggests what their friends might be interested in. This social aspect of the system helps the user to select friends for a specific movie according to their tastes. Moreover, it also suggests movies

⁶ <http://www.freebase.com/>

⁷ <http://dbpedia.org/>

⁸ <http://linkeddata.org>

according to the taste of specific friends which helps to come up with a good proposal or to an agreement. A user can also review a movie their friends have seen, which is noted by the recommender system.

2 Broadcast Location-based Offers

The MovieGoer acts as a broker between customers and nearby cinemas or other services. It allows for cinemas to broadcast last-minute offers to users that might like the movie (and want to receive such information). Services near a cinema that the users can attend after or before a screening, such as cafes and restaurants, are also able broadcast their offers to users or even make packaged deals with the cinema for users. Using this system, a cinema and a nearby restaurant can agree on a movie and dinner package with an interesting price (e.g., 20% reduction on the normal price) and submit it to the MovieGoer system, which broadcasts the offer to relevant users.

3 MovieGoer on a Mobile Device

MovieGoer is available⁹ to users as a web application for hand-held devices, such as mobile phones or tablets. The application detects the user's position using the geolocation API. Previously collected data is displayed as a list of nearby movies airing soon. Since MovieGoer utilizes the LOD cloud, data, such as extended cinema information, restaurants nearby cinemas, and any other points of interest can be easily queried from the LinkedGeoData [2] endpoint.

Using FB as way to identify a user allows for the access of a user's likes and friends. This information can be used to recommend movies a user might want to see and friends that can also be interested in these movies. Extending information available for MovieGoer to make such recommendations, the service provides way for users to tag people (and themselves) as visitors of a particular movie showing. In addition to this, after they have watched the movie, they will be able to recommend the movie to friends or write a short review.

The user application is realised using HTML5, because it allows to make one web application that will work well on all modern mobile devices independently of the used operating system. If a later application will require access to phone-specific APIs, it can be easily wrapped using frameworks such as PhoneGap¹⁰ or Appcelerator¹¹.

⁹ <http://lokino.sti2.at/mobile/>

¹⁰ <http://www.phonegap.com/>

¹¹ <http://www.appcelerator.com/>

4 Data and Vocabularies Used

The information on movies is taken from Freebase¹², which gathers relevant movie information around the `fb:film.film` category. The location of cinemas and restaurants is provided by LinkedGeoData.

For mapping user interest, we decided to use the Weighted Interest Vocabulary¹³, which divides interests into likes and dislikes, links likes to a context and gives them a weight according to a specified scale. The vocabulary of Revyu¹⁴ is used to describe users' reviews.

Information on movie showtimes is found mainly on the websites of various cinemas. In order to offer this information to the users utilizing MovieGoer, cinemas are provided with a way to push their showtime information into the service. To describe showtime information, we use Linked Events Ontology¹⁵. Its `lode:Event` resource is used to describe a single movie showing or a restaurant reservation. The event is connected to a cinema, a restaurant and a user through the `lode:involvedAgent` property and the film to be shown through the `lode:involved` property. The time information of the event is described using the Time Ontology in OWL¹⁶ and connected to the event via the `lode:atTime` property.

Currently, the dataset contains movie schedule information for 56 cinemas of which four are located in Innsbruck and 52 are based in or near the city of Munich. Mash-ups of cinema listings serve as the main data sources, one for each city¹⁷. In one run, the scraper collects data for one or more days in the future. For a single day, the crawled information includes more than 2500 triples that represent over 450 showings.

5 Related Work

Alspector et al. [1] evaluate two different approaches on which movie recommendation can be based. The clique-based approach is that users with similar taste will like the same movies and the feature-based approach is that similar movies are liked by the same user. The approaches make use of users' ratings of movies and it is suggested to combine both approaches. The MovieGoer would use the user's FB page likes for the feature-based approach and make use of the clique-based approach by assuming that the user's friends might share, more or less, the same taste in movies.

Oliver Burkeman¹⁸ writes about the financial success of Groupon. It is a service that sends coupon-like offers, called deals, to consumers by email, such as

¹² fb - <http://rdf.freebase.com/ns/>

¹³ wi - <http://xmlns.notu.be/wi/>

¹⁴ rev - <http://purl.org/stuff/rev\#>

¹⁵ lode - <http://linkedevents.org/ontology/>

¹⁶ owltime - <http://www.w3.org/TR/owl-time>

¹⁷ Innsbruck - <http://kinoibk.info/>, Munich - <http://kinomuc.info/>

¹⁸ <http://www.guardian.co.uk/technology/2011/jun/11/groupon-internet-andrew-mason-interview>

discounts on visiting a hair dresser. The article also describes the new location-based Groupon Now! service for mobile devices providing the user with offers based on their location. The user can express what they are in the mood for at a particular moment and get offers based on that. Groupon has recently launched Personalized Deals¹⁹, which targets deals to users based on preferences the user specifies to the service. The MovieGoer provides a similar kind of infrastructure for broadcasting offers to potential cinema clients. The difference between MovieGoer and Groupon is that the user does not have to specify their interests to the system explicitly, as MovieGoer does it for them by analysing their FB profile.

Neil Hughes on the AppleInsider web page²⁰ writes about a patent application by Apple titled "Systems and Methods for Providing Context-Based Movie Information". The idea of that patent is very similar to the MovieGoer, as it takes into account the user's location and provides them with movie showtime information for nearby cinemas. In addition to this, it also takes into consideration the user's calendar entries. MovieGoer allows the user to browse movie showtimes for any location and not only those nearby, because they might be planning a trip to some other place and want to check movie showtimes there. As a matter of fact, MovieGoer last-minute offers depend on location information.

6 Discussion

The MovieGoer's initial recommender system is built on pages that a user likes on FB. The success of that recommender system could be evaluated by looking at the movies the user finally chooses and which they review positively. One learning input is derived from the expertise of the user's friends. It would be interesting to compare how well those suggestions compete with the recommender system based on the user's profile. MovieGoer could also measure, whether users that attend the movies frequently together share a similar taste. This works also the other way around and the following research question arises: What kind of an interaction do users that share a similar taste have on the MovieGoer system or on FB?

References

1. Joshua Alspecter, Aleksander Koicz, and N. Karunanithi. Feature-based and clique-based user models for movie selection: A comparative study. *User Modeling and User-Adapted Interaction*, 7:279–304, 1997. 10.1023/A:1008286413827.
2. Sören Auer, Jens Lehmann, and Sebastian Hellmann. Linkedgeodata: Adding a spatial dimension to the web of data. In A. Bernstein, D. Karger, T. Heath, L. Feigenbaum, D. Maynard, E. Motta, and K. Thirunarayan, editors, *The Semantic Web - ISWC 2009*, volume 5823 of *Lecture Notes in Computer Science*, pages 731–746. Springer Berlin / Heidelberg, 2009. 10.1007/978-3-642-04930-9_46.

¹⁹ <http://www.groupon.com/blog/cities/personalized-deals/>

²⁰ http://www.appleinsider.com/articles/11/06/09/apple_investigating_iphone_app_to_coordinate_movie_times_with_other_plans.html