



GenialChef

Recommender agents make recommendations to users according to the information about items (e.g., restaurants) as well as different profiles of other users on the system. Many recommender agents have been developed on the Internet where the typical architecture is a centralised server where users are connected in order to obtain their recommendations. However, when we apply the agents' theory to recommender systems, a standard centralised recommender system becomes a distributed world of recommender agents. Our work is in this latter line: GenialChef is an agent-based system that provides a distributed restaurant recommender service.

This multi-agent system consists of service agents and personal agents (PA). Among the service agents, we distinguish the restaurant server agent (RSA) and the personal agent facilitator agent (PAFA). The RSA provides information about any given restaurant found by name, by address or by location. It can also provide information from its case-based reasoning engine developed over the database. Due to the similarity functions among restaurant attributes, we can retrieve restaurants that are very similar to a given one as well as restaurants closest to what the user has in mind. There could be many RSAs in the system, each one providing information about the restaurants of a given city. The other service agent, the PAFA, acts as a broker agent: it is in charge of assisting PAs to find and contact other PAs.

The PAs are in charge of recommending restaurants to the user. Each user has their own PA in their local machine and the service agents placed in the server give assistance to them. Each personal agent encapsulates the user profile and filters recommendations based on this profile. Therefore, the privacy of the personal data is protected. A content-based filtering method based on case-based reasoning is applied in order to make recommendations to the user based on the content of the items. However, collaborative filtering cannot be applied since the user profiles are protected by each recommender agent and it is impossible to make direct comparisons among them. Collaboration is achieved by means of the exchange of opinions on restaurants. Opinions represent the general interests of the user without revealing detailed information. Therefore, a new information filtering method comes up: the opinion-based filtering method. It consists of reinforcing the recommendation process with opinions from other agents. In order to know which agents to enquire, PAs consider other PAs as personal entities on whom they can rely or. Reliability is expressed through a trust value. Therefore, a social model of trust is proposed in order to represent, initialise and evolve trust values. Thanks to this model of trust, an evolution of the collaborative filtering method can be applied. PAs only ask for advice to their reliable friends. The proposed collaboration generates a social network of PAs really useful in order to study social behaviours.

In order for our agents to communicate, an extension of the ontology of the Agentcities.RTD project has been developed. The ontology encompasses the communication between PAs and RSAs, between PAs and PAFAs and among PAs.

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GenialChef was put forward at the E-TECH 2003 Prizes and was awarded the prize for the best university project. The IRES project was presented to the AgentCities Technology Competition and was awarded the special prize for the best system deployed in the AgentCities Network. Visit <http://arlab.udg.es> for more information about the project and the prize.

Current Version: v1.0. under JADE 2.6

Publications describing the System:

1. M. Montaner, B. López and J. L. de la Rosa. [Developing Trust in Recommender Agents](#). In *Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS'02)*. Cristiano Castelfranchi and W. Lewis Johnson (Eds). ACM Press. vol. 1, pp. 304-305. Bologna (Italy), 2002.
2. M. Montaner, B. López and J. L. de la Rosa. [Improving Case Representation and Case Base Maintenance in Recommender Agents](#). In *Proceedings of the 6th European Conference on Case Based Reasoning (ECCBR'02)*. Susan Craw, Alun Preece (Eds.), *Lecture Notes in AI N2416*. Springer-Verlag. pp. 234-248. Aberdeen (Scotland), 2002.
3. M. Montaner, B. López and J. L. de la Rosa. [Opinion-Based Filtering Through Trust](#). In *Proceedings of the 6th International Workshop on Cooperative Information Agents (CIA'02)*. Matthias Klusch, Sascha Ossowski and Onn Shehory (Eds.), *Lecture Notes in AI N2446*. Springer-Verlag Berlin Heidelberg, pp. 164-178, Madrid (Spain), 2002.
4. M. Montaner, B. López, and J. L. de la Rosa. [A Taxonomy of Recommender Agents on the Internet](#). *Artificial Intelligence Review*, Kluwer Academic Publishers. Volume 19, Issue 4, pp. 285-330, June, 2003.
5. E. del Acebo and J. L. de la Rosa. [A Fuzzy System Based Approach to Social Modeling in Multi-Agent Systems](#). In *Proceedings of the First International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS'02)*. Cristiano Castelfranchi and W. Lewis Johnson (Eds). ACM Press. Bologna (Italy), 2002.
6. G. González, B. López and J.L. de la Rosa. [The Emotional Factor: An Innovative Approach to User Modelling for Recommender Systems](#). RPeC'02.



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