FROM SOCIAL BIG DATA TO PERSONALIZED TASKS RECOMMENDATIONS: A SEMANTIC APPROACH

Menna Allah Maged Moustafa Kamel

Advisors: **Alberto Gil Solla**

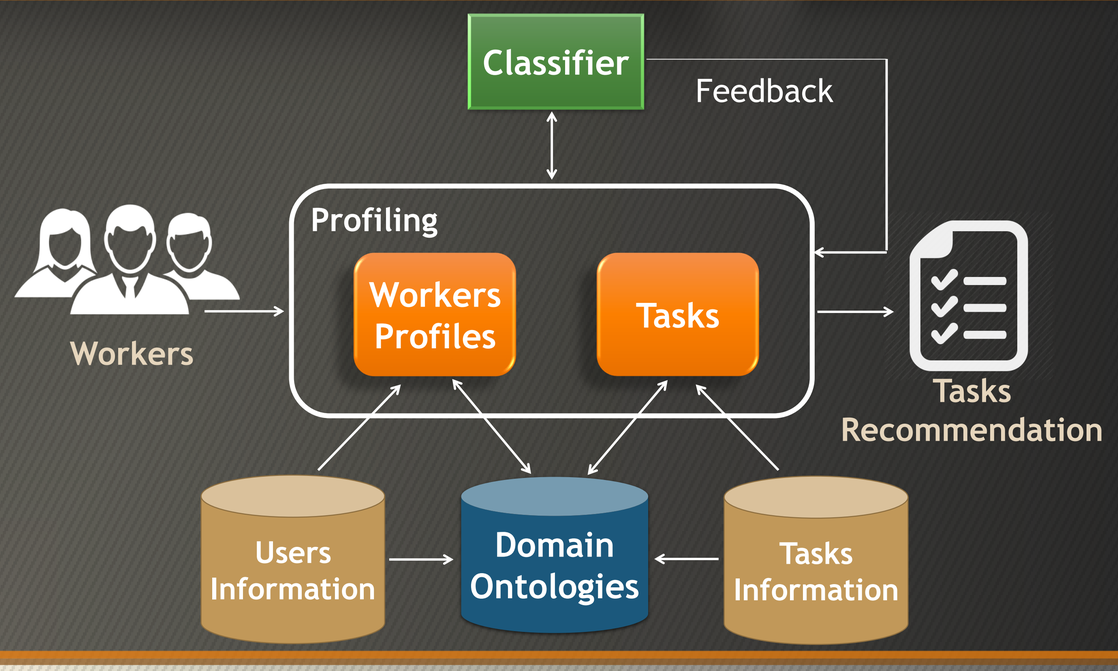
Manuel Ramos Cabrer

PhD Program on Information and Communications Technology, University of Vigo, Spain

Motivation of the Work

Crowdsourcing allows to build hybrid online platforms that combine information systems with the power of human intelligence to complete tasks that are difficult to tackle for current algorithms. Current approaches to crowdsourcing adopt a pull methodology where tasks are published on specialized web platforms where workers can pick their preferred tasks on a first-come-first-served basis [1]. However, this mechanism does not guarantee that the worker who performs the task is the best fit.

The goal of the research is to develop a crowdsourcing approach based on a push methodology. This approach selects which workers should perform a given task based on information from the workers profiles [2] [3]. This information includes personal data and professional ones as well. Some of this information are structured and others are unstructured that must be processed to find relevant data in it [4] [5]. The workers profiles are constructed from their social networks information, as well as explicit data provided by the workers and Information got from the feedback process.



Thesis Objectives

- Analyze the information extracted from the social networks and identify the relevant data from it.
- Select domain ontologies to map the extracted data.
- Design semantic techniques to discover additional attractors for users in order to build enhanced workers profiles and also extend information about tasks recommendations
- Define semantic data mining classification algorithm to measure adequacy among extracted workers profiles and the customized tasks predictions
- Test the results in the specialized crowdsourcing domain

Research Plan

2017 - 2018

- Survey the contributions in social big data analysis and recommendation systems.
- Study different existing ontologies and how data are structured in them, like DBPedia and YAGO.
- Study the state-of-the-art of sematic reasoning in custom recommendations.

2018 - 2019

- Design and develop mechanisms to extract information from social networks.
- Select and integrate the information provided and map them to ontology.
- Define algorithm to model workers and tasks information and classify them accordingly.

2019 - 2020

- Evaluate and test the classification using semantic data mining techniques.
- Design and refine the completed personalized crowdsourcing recommendation system.
- Test and evaluate the system results.

Publications and Thesis Dissertation Writing

Next Year Planning

1. Design and model the extracted workers and tasks information using domain ontologies
2. Integrate inputs of the extracted workers information
3. Define and model the tasks information
4. Translate the extracted workers and tasks information to feed the classifier
5. Evaluate and test the classification method
6. Publish paper in a conference

UNIVERSIDADE DE VIGO

References

[1] Difallah, D. E., Catasta, M., Demartini, G., Ipeirotis, P. G., & Cudré-Mauroux, P. (2015, May). The dynamics of micro-task crowdsourcing: The case of amazon mturk. In Proceedings of the 24th International Conference on World Wide Web (pp. 238-247). International World Wide Web Conferences Steering Committee.

[2] Difallah, D. E., Demartini, G., & Cudré-Mauroux, P. (2013, May). Pick-a-crowd: tell me what you like, and i'll tell you what to do. In Proceedings of the 22nd international conference on World Wide Web (pp. 367-374). ACM.

[3] Bozzon, A., Brambilla, M., Ceri, S., Silvestri, M., & Vesci, G. (2013, March). Choosing the right crowd: expert finding in social networks. In Proceedings of the 16th International Conference on Extending Database Technology (pp. 637-648). ACM.

[4]Ali, F., Kwak, D., Khan, P., Ei-Sappagh, S. H. A., Islam, S. R., Park, D., & Kwak, K. S. (2017). Merged ontology and SVM-based information extraction and recommendation system for social robots. IEEE Access, 5, 12364-12379.

[5]Dou, D., Wang, H., & Liu, H. (2015, February). Semantic data mining: A survey of ontology-based approaches. In Semantic Computing (ICSC), 2015 IEEE International Conference on(pp. 244-251). IEEE.