L-Università ta' Malta
Faculty of Information & Communication Technology

B.Sc. IT (Hons.)
Artificial Intelligence

Predicting links in a social network based on recognised personalities

Andrew Aquilina
Supervisor: Dr. Charlie Abela

INTRODUCTION

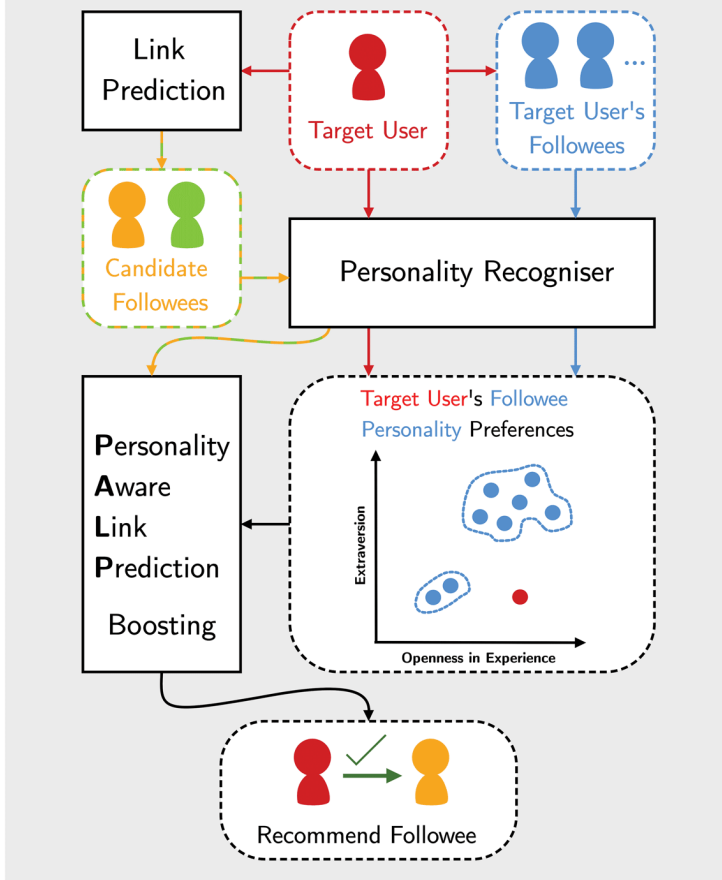
Link Prediction has become ubiquitous within online social networks (OSNs). A prominent example is the "People You May Know" feature on Facebook. Although personality is known to influence social relationships **[1]**, its impact within OSNs is oftentimes overlooked. Psychologists show that personality can be extracted from language use **[2]**. The main aim of this research is to study the relationship between recognised personalities and OSN followee connections, as shown by the following objectives:

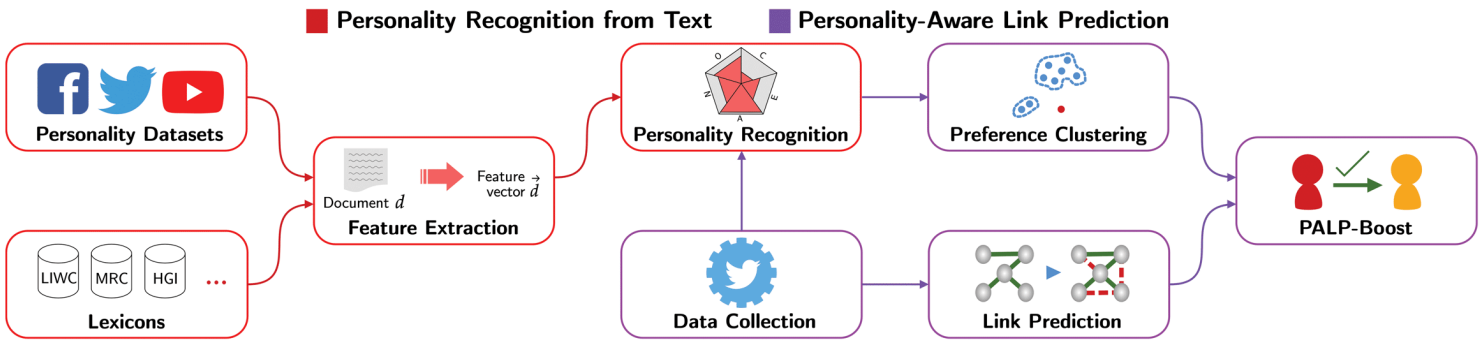
- Personality Recognition from Text (PRT): Extraction of users' personality traits from their micro-blog postings using a number of machine learning models.
- Personality-Aware Link Prediction (PALP): Each individual may have their own personality preferences when choosing who to follow **[3]**. Taking these preferences into account to improve prediction accuaracy encapsulates this objective.

METHODOLOGY

Using a wide variety of lexicons, linguistic features are derived from one's micro-blog postings. These features are interpreted by trained machine learning models to recognise the writer's personality. The models are then applied to a real Twitter network. Giving followee recommendations to a user in the network involves clustering their implicit followee personality preferences and using the PALP-Boost algorithm to score candidate followees based on their proximity to such clusters.

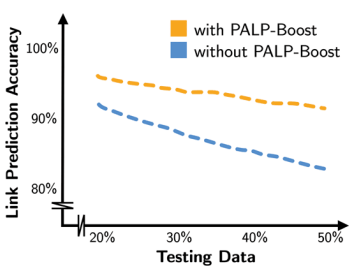
ARCHITECTURE DESIGN





RESULTS

- PRT component: The best performing personality recogniser was found to be a Support Vector Regression model with a Pearson VII function-based kernel. In the best case, the model competitively yields a Mean Absolute Error of 0.105 for the Openness trait, within a normalised scale of [0-1].
- PALP component: The PALP-Boost algorithm increased the accuracy of various path and topological-based link predictors, boosting it by 10% in the best case.



CONCLUSION & FUTURE WORK

By utilising the relationship between language and personality, a PRT component has been developed. Results indicate that OSN link prediction accuracy can be improved when infused with the users' implicit followee personality preferences.

The effectiveness of the PALP-Boost algorithm depends on the accuracy of the personality recogniser at hand. Future work can serve to address this.

REFERENCES

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[3] Antonela Tommasel, Alejandro Corbellini, Daniela Godoy, and Silvia Schiaffino. *"Exploring the role of personality traits in followee recommendation"*. In: Online Information Review (2015).