

POLITECNICO DI TORINO

PhD in Computer and Control Engineering

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# Content Recommendation Through Linked Data

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The general problem addressed is **information overload**. To have an idea, in one minute on the Web:

- **3M** likes, **250K** new pictures, **3M** shares occur on Facebook;
- **430K** tweets are published;
- **56K** pictures are uploaded on Instagram;
- 300 h of videos are added in Youtube.

**Linked Data** is a set of best practices to publish structured data on the Web.

**Recommender systems** are software tools to suggest interesting items to users.



### 2. Goal

The goal of this Ph.D. is discovering useful information from the enormous amount of Linked Data. In particular, we aim at answering the following research questions:

- How to exploit relationships among resources on the Web to provide recommendations?
- How to represent the user and her context to provide recommendations?
- How to effectively visualize recommended resources and their relationships?

#### 3. Approach

The overall approach is showed in Figure 1. It consists of three main contributions, each addressing one research question:

- **ReDyAI**, a new recommendation algorithm which exploits relationships among resources published on the Web as Linked Data [1].
- **RSCtx**, an ontology to represent the user's context representation for recommender systems and a new context-aware approach which can be applied to existing recommendation algorithms [2].
- DBpedia Mobile Explorer, a framework to visualize Linked Data based recommendations [3].

#### 4. Results

We comparatively evaluated ReDyAl against three state-of-the-art algorithms, through a study that involved 109 participants. The study showed that our algorithm has a good trade-off between prediction accuracy and novelty. The results are showed in Figure 2.

We evaluated our context-aware approach by means of a dataset of user ratings about concerts collected from Twitter. The study showed that, when used with well-known recommendation algorithms, our approach can significantly improve the prediction accuracy. The results are showed in Table 1.

## 5. Conclusions

The ReDyAI algorithm has a good trade-off between prediction accuracy and novelty.



Figure 2: Evaluation of ReDyAl

Algorithm	With RSCtx	Without RSCtx
Random Guess	0.2315	2.0998
User Average	0.2312	0.3026
Item KNN	0.2312	0.3976
SVD++	0.2514	0.3511
Time SVD++	NA	0.2693

Table 1: Evaluation of our context-aware approach

Our context-aware approach can significantly improve the prediction accuracy of existing recommendation algorithms.

#### 6. References

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