PITAGORA: Recommending Users and Local Experts in an Airport Social Network

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PITAGORA is a mobile web **contextual social network** designed to be used in the check-in area of an **airport**. It provides recommendation of **potential friends**, **local experts**.

Users are profiled analysing **data** extracted from **Facebook** and **LinkedIn** accounts. When the user logs into the system the following data are extracted:

a) demographic infos, connections, level of education, job history (Facebook and LinkedIn);
b) page 'likes', photo albums (Facebook)
c) groups and companies followed (LinkedIn).

Profiles are described as vectors of pages on which users have expressed a 'like' and groups or companies followed.

A **co-occurrence matrix** is used **to infer additional possible resources of interests**.

Users' recommendation is then achieved with a standard **user-based algorithm** considering the distribution of user's interests and computing a nearest-N users' neighbourhood with the Euclidean distance.

User travel experience per city is computed considering:

- **count of city visits** is used to compute **users travel experience**,

- **social media analysis** (demographic infos and Facebook photo albums);

- **user activity** in the social network (flights search)

- **cities' correlation** (based on visiting people and distance)

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Pitagora

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Meet people

Interests

- ♪ Music
- ⚽ Sports
- 📖 Books
- 📚 Organizations
- 🎗 Cause
- 📰 Magazines and New

Chat

Leisure

Eddie Punch
▼ 😊

Jane Dore
▼ Let's meet a

John Dore
▲ Hi!

John Smith
▼ Ok, see you

Jane Dore

Hi, how are you?
12:15

I'm fine thank you, and you?
12:16

Very well, thanks!
12:16

:)
12:16

Let's meet at Giunti al punto! We both like Books
12:18

To evaluate the relevance of user recommendations the normalised **Cumulative Discounted Gain (nDCG)** measure has been used.

Relevance scores are computed comparing the list of recommended users with the ideal list given by the user.

The **ground truth** has been collected asking **150 users** to express a relevance score (on a 0 to 3 scale) for the first J people suggested by the system. In this experiment, a logarithm with base 2 is used to ensure all positions are discounted.

The **nDCG** for the top-J item results in values of **0.767 with j=5** and **0.872 for j=10**.

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