INTELLIGENT SYSTEMS TO SUPPORT THE CREATION OF SPORADIC COMMUNITIES IN PHYSICAL AND VIRTUAL SPACES

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Motivation of the work

- In many settings (physical and virtual ones), there are opportunities to form groups among the people who meet there, driven by information about their interests, preferences and needs, as well as spatial and temporal features of context.
  - Recently, popular portals have promoted a concept of *sporadic groups for online language learning* (SGOLL) to work on specific topics or engage in conversations. Some authors have shown that proper (not random) formation of the groups –together with careful selection of topics– can improve learning outcomes.
  - In smart cities and buildings, several works have highlighted the interest of identifying groups of interest for entertainment, commercial, tourism or cultural purposes.
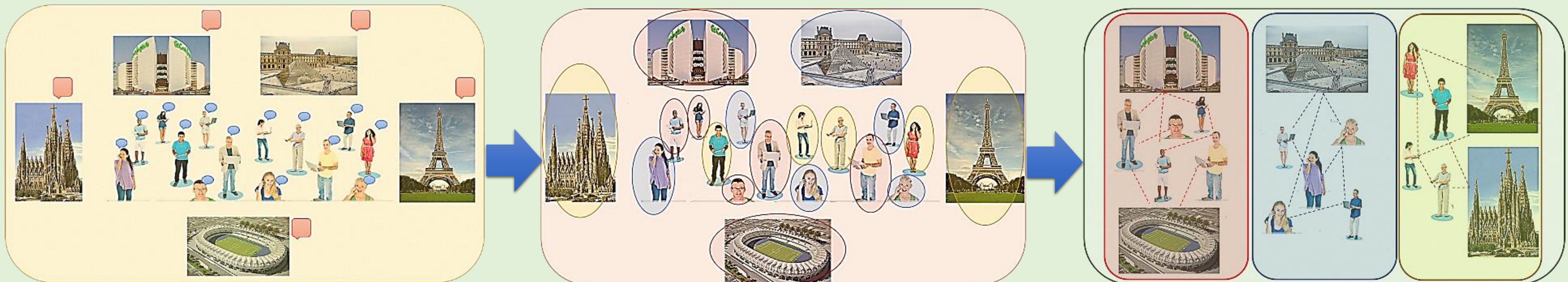
Thesis Objectives

General goal:
- Design a generic approach to the formation of sporadic groups, coupled with personalization and recommendation engines.

Specific goals:
- Develop and test affinity metrics to match various types of user profiles, containing psycho-demographic data, personality traits, topics of interest, professional capabilities, etc.
- Develop and test context-aware group formation strategies.
- Develop and test new mining mechanisms to enrich user profiles from different social networks (Facebook, Twitter, LinkedIn, etc.).
- Design monitoring and feedback mechanisms to train the group formation algorithms

Research Plan

(2014-2015) Familiarization with the state-of-the-art in areas of semantic web, recommender systems, profile matching and sporadic social networks.
(2015-2016) First steps in the definition of affinity metrics and group formation strategies. Development of an intelligent system to aid in the formation of sporadic groups in a SGOLL portal. Participation in the doctoral consortium of ICALT 2016.
**(2016-2017)** Refinement of proposals. Evaluation of SGOLL demonstrator. Development and evaluation of a second demonstrator for cultural experiences in museums, in the context of the CrossCult H2020 project. Submission of two conference papers.
(2017-2018) Completion of proposals. Development and evaluation of a third demonstrator for crowdsourcing applications. Submission of a conference paper and a journal paper.
(2018-2019) Documentation and thesis presentation.

Preliminary Results

- The analysis of the state-of-the-art has been completed.
- The design of the demonstrator for a SGOLL portal is ready.
- We are gaining insight into software tools for its implementation.
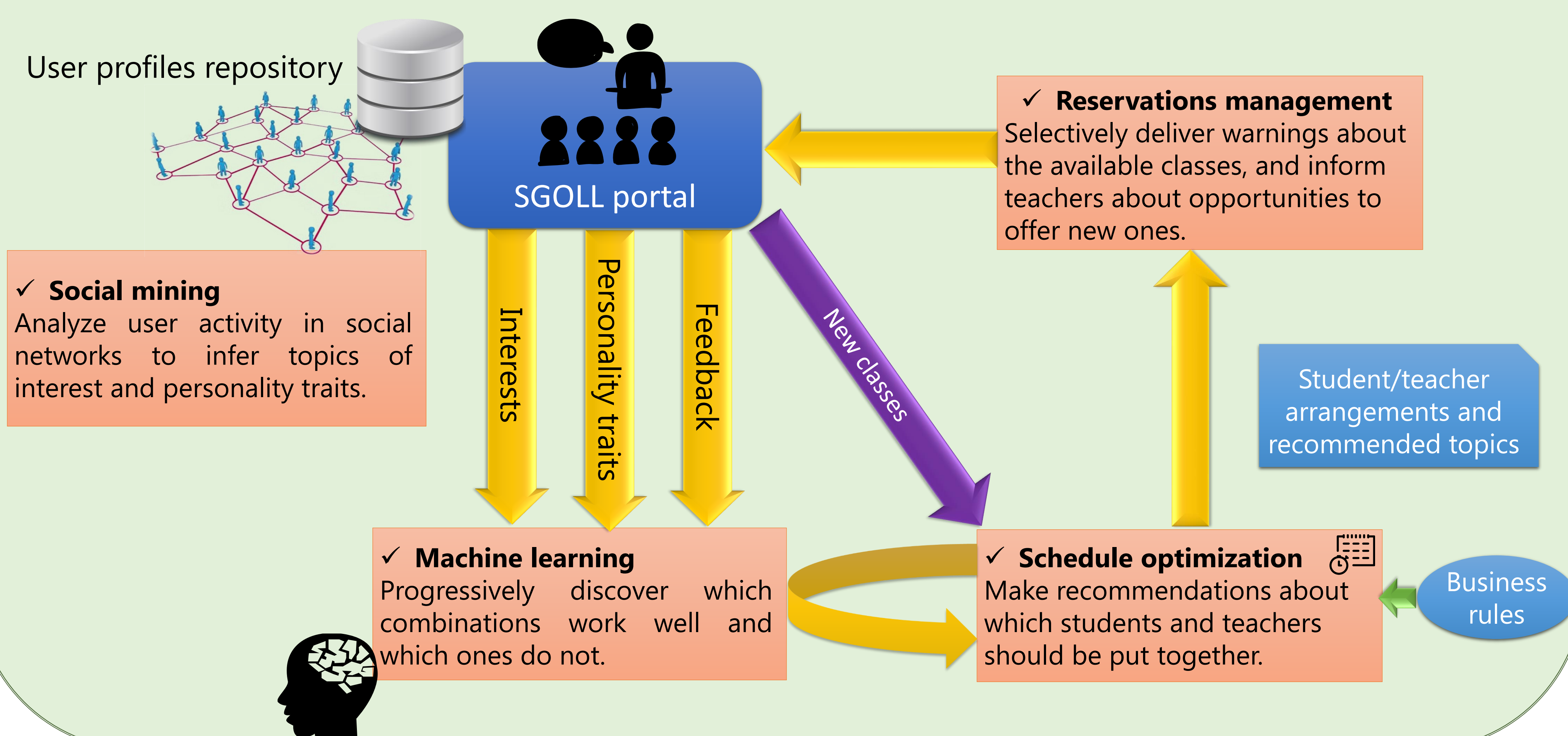
Next Year Planning

September–December 2016:
Analyze and use machine learning and optimization tools (NuPIC, Weka, OptaPlanner) to drive the formation of groups.

January–March 2017:
Create a simulation environment to assess the ability of the selected tools to discover association patterns.

April–July 2017:
Test the SGOLL demonstrator with real users. Preparation of reports.

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