

PhD Position in Recommendations for developing preferences and goals

Jheronimus Academy of Data Science (JADS), Den Bosch (4 year project)

JADS, a data science institute founded jointly by the University of Tilburg and the Eindhoven University of Technology, is looking for a talented PhD student working on “recommendations for developing preferences and goals”, starting as early as November 2017. The project is funded by JADS internally.

Project description

What we like today might not be what we like tomorrow. Our tastes evolve and prior preferences might not represent our current needs and goals. For example, someone may want to develop a taste for opera or wants to improve current exercise or dietary habits.

Recommender systems typically use historical user data to assess individuals' current preferences and to predict what an individual will appreciate based on historical data of other users. Though this “collaborative filtering” approach can help individuals to find novel items that fits their current preferences, it is problematic in situations of preference development. We need algorithms that are smarter and that can actually predict future preferences!

Preference development could be either system- or user-initiated. The system itself might initiate specific new preferences and goals to explore for users. Whereas existing collaborative filtering approaches mostly try to find users with similar current tastes, we want to test whether we could also use this approach to find users that have shown similar preference evolutions in the past. This allows us to build exploration algorithms and interfaces that can help users to step away from their (potential) filter bubbles and, for instance, explore new tastes for other music domains or to get a more comprehensive view on a subject by reading other news articles. In the exercise domain a user of a sports tracker can be recommended new activities and exercise programs that have helped other similar users in the past to increase their performance. Our recent work on recommendations for energy saving measures has already been successful in helping users to move forward in their energy saving efforts.

New preferences and goals can also be user-initiated. For example, users might explicitly want to develop a taste for some type of music or have an explicit goal to achieve a level of fitness or weight reduction. In such cases the goals of the user might need to be represented more explicitly in the system, and recommender systems can benefit from knowledge of psychological theories on behavioral change to build algorithms that also model how to guide users to achieve their goals in a personalized way. Despite many efforts in e-coaching, very few systems actually take a personalized approach to behavioral change using recommendation technologies as proposed in this PhD project.

This project requires a multidisciplinary approach in which insights from psychology on decision making and habit formation are paired with new approaches to recommendation that included preference evolution, interactive exploration/exploitation methods and goal-directed approaches. Moreover,

when evaluating the success of such algorithms, longitudinal experiments combining objective behavioral data and subjective user experience will be required to fine-tune and optimize recommendation approaches. For this part novel sequential experimentation approaches can be tested in collaboration with the computational personalization lab at JADS.

Work environment and supervision

The position will be supervised by dr. Martijn Willemsen (TU/e); principal investigator of the **recommender lab** at JADS (see <http://www.martijnwillemsen.nl/recommenderlab>).

The recommender lab is part of the **“Data & Humans” theme** (headed by prof. dr. Maurits Kaptein & dr. Martijn Willemsen). Within the theme prof. dr. Eric Postma (TiU), prof. dr. Chris Snijders (TU/e), prof dr. Wijnand IJsselsteijn (TU/e), and prof. dr. Jack van Wijk (TU/e) will contribute to the project and supervision. Other research labs within the theme focus on understanding **computational personalization, data visualization, and modeling networked sensor data.**

The PhD student will be part of the JADS eco-system: both the Data & Humans theme as well as JADS as a whole offer a strong PhD program, frequent scientific seminars by internal and external speakers, and the ability to follow graduate level courses at both TiU and TU/e. JADS offers the unique opportunity to be embedded in a starting research institute, with its associated freedom, while being firmly grounded and supported by experts from two top Dutch Universities.

The positions includes allowances for research expenses, including computer, participant costs, experimental materials, and travel and subsistence costs towards project-specific travel, including conferences. The positions also offers an opportunity to gain experience with teaching, subject to availability and qualifications.

Requirements

You have or are about to finish a (research) MSc in Computer Science, Mathematics, Data Science or in the field of Human-Computer Interaction with a strong quantitative profile. You have an interest in Data Science and Machine Learning as well as in HCI and user psychology. Preferably you have in depth knowledge on information retrieval or recommender systems and HCI topics. This project is truly at the edge of what is understood at this point; we are looking for an independent thinker who is willing to explore new multidisciplinary directions.

Conditions of employment

The position starts in November 2017 but a later date may be considered. JADS offers outstanding employee benefits, as well as an inspiring work environment and exciting campus life. We offer a full time temporary appointment for a period of 4 years. The gross monthly salary will be in accordance with the salary scales for PhD candidates at Dutch universities, i.e. ranging from €2,191 in the first year to €2,801 in the final year. The Collective Labour Agreement for Dutch Universities is applicable. Researchers from outside the Netherlands may qualify

for a tax-free allowance equal to 30% of their taxable salary. The university will apply for such an allowance on their behalf. All university employees are covered by the so-called civil servants pension fund (ABP). The university offers very good fringe benefits such as an options model for terms and conditions of employment, excellent reimbursement of moving expenses, excellent technical infrastructure and sports facilities.

Contract type: Temporary, 4 years

Employer: JADS, Den Bosch.