

6 Month Internship Opportunity In Computer Science Applied To Eating Behaviours

Title	<i>Personalized Recommendations for a Healthy Diet: Dynamic and Sequential Recommendations</i>
Mission	<p>While overweight and obesity are common in developed countries, informative campaigns about the importance of a healthy diet undertaken by the national governments and international agencies have only met limited effect. In order to facilitate the choice of healthy food, recommendation systems (automated computer tools that acquire models of user preferences and provide personalized suggestions to the user) have been recently proposed by a number of researchers.</p> <p>Current recommender systems are, however, severely limited as they fail to model the user choices in a sophisticated way (for example, do not account for preferences for combining certain dishes in a meal, habits for eating particular dishes on certain days, or do not provide enough diversification in their recommendations). Such systems should, indeed, be able to learn from the preferences from past activities and to update them over time, in order to adapt the recommendations in such a way that users are more likely to accept them. Moreover, in order to be effective, a food recommender system should be able to detect temporal patterns and to provide recommendations for several meals (and not just the next meal), ensuring a certain degree of diversity and nutritional value, while satisfying as much as possible the preferences of the user. Moreover, eating behaviors may display some patterns over time, these can be easy to identify (such as preferences for eating fish on Friday, or a dessert on Sunday at lunch) or more subtle.</p> <p>This internship is part of a bigger project the final goal of which is that of designing and developing a food recommender system with two novel characteristics: the possibility to provide sequential recommendation (a complete meal, a plan of meals for a week), and the capability of dealing with the temporal aspects: recognizing preferences that involve a sequence of items (and their relations) and preferences that may change over time.</p> <p>In this context, the goal of this stage is twofold. The student will investigate (1) how to model the way the users associate food items (e.g. eating fish and drinking white wine) and (2) how to model the temporal aspect of the choices.</p> <p>In order to achieve this goal, the student will review the current literature on recommendation systems in the “classical” collaborative filtering domains (e.g. as Spotify, YouTube, etc) focussing on approaches that account for dynamic aspects and provide sequences of recommendation. He/she will, then, adapt these algorithms and/or propose new algorithms for the domain of food recommendations and will evaluate the proposed methods by doing tests with real consumption data.</p>
	<p><u>References:</u></p> <p>- Thi Ngoc Trang Tran, Müslüm Atas, Alexander Felfernig, Martin Stettinger: <i>An overview of recommender systems in the healthy food domain. J. Intell. Inf. Syst.</i> 50(3): 501-526 (2018)</p> <p>- Mouzhi Ge, Francesco Ricci, David Massimo: <i>Health-aware Food Recommender System. RecSys 2015: 333-334</i></p> <p>- Ramesh Baral, S. S. Iyengar, Tao Li, N. Balakrishnan: <i>CLoSe: Contextualized Location Sequence Recommender. RecSys 2018: 470-474</i></p>
Prerequisites	Be enrolled in master2 in data sciences, or computer science.
Place	UMR MIA-AgroParisTech, 16 rue Claude Bernard Paris 5 th arrondissement.
Duration	6 months of internship from March / April 2020, full-time.
Remuneration	Gratification according to the INRA scale in force (approx. 570 Euros / month in 2
Contact	cristina.manfredotti@agroparistech.fr, paolo.viappiani@lip6.fr, nicolas.darcel@agroparistech.fr