



## Open PhD position

<b>Title</b>	Individual learner models in multimodal collaborative learning analytics
<b>Scholarship duration</b>	3 years
<b>Research laboratory</b>	<a href="#">Centre interuniversitaire de recherche en éducation de Lille</a> (EA 4354) <a href="#">UCL Knowledge Lab</a> , UCL Institute of Education
<b>Address</b>	Université de Lille (Campus Cité scientifique), France University College London, United Kingdom
<b>Starting date</b>	September 2022
<b>Deadline for application</b>	1 <sup>st</sup> April 2022
<b>Funding type</b>	The framework of the AI_PhD@Lille program (highly competitive monthly salary and no teaching required)
<b>PhD directors</b>	Nour El Mawas ( <a href="https://nour-elmawas.com/">https://nour-elmawas.com/</a> ) Jean Heutte ( <a href="https://pro.univ-lille.fr/jean-heutte/">https://pro.univ-lille.fr/jean-heutte/</a> ) Mutlu Cukurova ( <a href="https://iris.ucl.ac.uk/iris/browse/profile?upi=MCUKU85">https://iris.ucl.ac.uk/iris/browse/profile?upi=MCUKU85</a> )
<b>Keywords</b>	learner modelling, Multimodal Learning Analytics, project-based collaborative learning

## Summary

Project-based collaborative learning is a form of situated learning, in which students engage in real-world activities that are similar to the activities that professionals engage in (Sawyer, 2005). It covers a set of cognitive abilities and skills that are challenging to learn and to assist. The fact that learners collaboratively have to build different skills' granularities, provides another level of difficulty. In addition, the hands-on and open-ended nature of project-based learning creates challenges for tracking the learning process (Spikol et al., 2017). In collaborative settings, modelling individual students' skills using Multimodal Learning Analytics is crucial to facilitate learner's follow-up and teachers' practices in various learning environments. Hence, the prediction of collaborative learning outcomes is important to assist learners at suitable times. Relevant predictions rely on a competence model and its associated learner models that are yet to be defined.

Learner Models represent the system's beliefs about the learners' specific characteristics, relevant to the educational practice (Gilliot et al., 2016). Learner Models aim to encode learners individually (El Mawas et al., 2018), using a well-defined set of dimensions (Nakic et al., 2015), such as flow (Heutte et al., 2021), cognitive states, behaviours, learning and/or personal preferences and others. Learner Modelling is a complex task relying mainly on three main fields: educational science, psychology and information sciences (Abyaa et al., 2019). Learner Models are usually enriched by data collection (and updating) techniques and mechanisms (Nguyen & Do, 2008), which (Vagale & Niedrite, 2012) observe as an ongoing, continuous process.

Multimodal Learning Analytics provides researchers with new tools and techniques to capture different types of data from complex learning activities in dynamic learning environments (Spikol et al., 2018). In educational contexts, Multimodal Learning Analytics (Blikstein, 2013) approaches are emerging and providing promising opportunities for more accurate and representative learner models

(Cukurova et al., 2020). Within the context of collaborative learning, (Martinez-Maldonado et al., 2013) collected data from verbal and physical interactions of students can provide insights into their collaborative actions that might also be used as proxies for their collaborative learning outcomes. The objective of this PhD opportunity is therefore to continue the efforts made by these various research works and understand and predict skills-building in project-based collaborative learning based on Multimodal Learning Analytics. This research work will be a significant contribution towards developing techniques to automatically identify the key aspects of students' success in project-based collaborative learning and to ultimately help teachers provide appropriate and timely support to students in these fundamental aspects.

*Reference:*

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## Benefits

We offer a 3-years full-time PhD position at the Université de Lille. The PhD student will be physically in France (Lille) but it is also expected that they spend some research time in London at University College London. If the applicant is admitted, they will be eligible for the PhD scholarship of the framework of the AI\_PhD@Lille program (2300 euros per month, no teaching required). The candidate will be part of an international research team of educational technology and will have the possibility to collaborate with experienced scholars.

Needless to mention that the candidate will be part of the lively student life of Lille city in France.

## Profile of applicant

A Master's degree (or equivalent) in Computer Science, Computer Engineering, Cognitive Sciences or similar is required.

The candidate must have good skills in Data Science (Data Analysis, Data Mining, and Machine Learning). Experience in processing sensor data in Python and R are highly desirable.

Excellent writing, speaking, and reading skills in English.

The PhD candidate should be highly motivated to work independently, but also to collaborate with the team and stakeholders.

Existing publications in relevant conferences (i.e. AIED, LAK, ICML etc.) are desirable.

## Information and Application

The successful applicant(s) will work under the mentorship of Dr Nour El Mawas, Pr Jean Heutte and Dr Mutlu Cukurova and will also have an opportunity to spend time in the two research labs. There is generous funding available to attend/present at international and local conferences every year. Expressions of interest via email to [nour.el-mawas@univ-lille.fr](mailto:nour.el-mawas@univ-lille.fr), [jean.heutte@univ-lille.fr](mailto:jean.heutte@univ-lille.fr) and [m.cukurova@ucl.ac.uk](mailto:m.cukurova@ucl.ac.uk) should include:

- A curriculum vitae
- A cover letter (in English) which explains your interest in the position and your qualifications;
- Academic records and degrees (incl. prizes, publications, participation in international programs such as Erasmus, double or joint degree(s));
- A copy of your Master's thesis;
- Two or more recommendation letters;

The deadline for application is the 1<sup>st</sup> April 2022. The doctoral studies will start in September 2022.