

# CROSSMMLA in practice: Collecting, annotating and analyzing multimodal data across spaces

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Call for submissions June 17, 2019 -v02

## Workshop Theme

As digital technologies permeate our everyday lives, technology-enhanced learning experiences are becoming increasingly ubiquitous and fluid. In such blended learning across multiple digital and physical spaces, traditional de-contextualized, log-based learning analytics may not be enough to understand the learning process, its meaning or its outcomes. Thus, analyzing evidence from multiple data sources will become increasingly needed and commonplace, if we are to extract meaning from these increasingly fluid, increasingly complex kinds of transformative learning (cf. the conference theme on transforming learning and meaningful technologies).

The field of multimodal learning analytics (MMLA) addresses this need, often by leveraging advances in machine learning and increasingly affordable sensor technologies (Ochoa, 2017). These techniques allow MMLA to provide new types insights into learning processes that happen across multiple contexts between people, devices and resources (both physical and digital), which often are hard to model and orchestrate (Scherer et al., 2012; Prieto et al., 2016). Using such technologies in combination with machine learning LA researchers can now perform text, speech, handwriting, sketch, gesture, affective, neurophysical, or eye-gaze analysis (Donnelly et al., 2016; Blikstein & Worsley, 2016).

However, with this increased complexity in data new challenges also arise. The data gathering, pre-processing, analysis, annotation and sense-making, in a way that is meaningful for learning scientists and other stakeholders (e.g., students or teachers), still pose challenges in this emergent field. It is on these challenges and the sharing of practical solutions to those challenges, that this workshop focuses. This full-day event will provide participants with hands-on experience in gathering data from learning situations using multiple technologies (in the morning), and how to analyze/annotate such data to obtain insights about the learning experience (in the afternoon):

- Before the event, teams of participants will be formed, and teams will decide the learning task they wish to address, and which of the proposed multimodal data gathering and analysis methods they intend to use.
- During the event, participant teams will execute their MMLA project: enacting sample learning activities, gathering multimodal data, and later analyzing and making sense of them. In this way, the workshop will provide opportunities, not only to learn about exciting new technologies and methods, but also to share participants' own practical proposals for MMLA, and meet and collaborate with other researchers in this area.

## Submissions

To shape the practical activities of the workshop, we encourage participants to propose their own multimodal analytics processes or contexts of application, to be used by the teams of participants during the workshop. These proposals will take the form of brief paper submissions, which will be shared with the participants in the workshop website before the event. Submissions should be made via [EasyChair](#), by June 30, 2019. Each

submission should include one or more of the following elements (in no more than 3 pages per element, using the [LNCS paper format](#)):

- Sensor/Data gathering setups and prototypes (e.g., the use of the Multimodal Learning Hub to collect data), to be used during the morning part of the workshop
- Data analysis/annotation methods and tools (e.g., Visual Inspection Tool and coding schemas that can be used), to be used during the afternoon part of the workshop
- Learning activities/Pedagogical designs that could benefit especially from CrossMMLA techniques, to be used as “sample learning tasks” on which to gather and analyze data during the workshop
- Examples of CrossMMLA research designs or case studies, on which participant teams can inspire themselves to develop their MMLA project

## Dates

Date	Action
3 June 2019	Deadline for workshop submissions
30 June 2019	Deadline for workshop submissions
31 July 2019	Assumed Early Bird registration limit
1 September 2019	Team project proposals
16 September 2019	Planned Workshop Dates in Delft NL (one or the other)

## Organizers

**Inge Molenaar**, Radboud University, The Netherlands

**Daniel Spikol**, University of Malmö, Sweden

**Daniele Di Mitri**, Open University, The Netherlands

**Luis P. Prieto**, Tallinn University, Estonia

## References

Blikstein, P., & Worsley, M. (2016). Multimodal Learning Analytics and Education Data Mining: using computational technologies to measure complex learning tasks. *Journal of Learning Analytics*, 3(2), 220–238.

Donnelly, P. J., Blanchard, N., Samei, B., Olney, A. M., Sun, X., Ward, B., ... D’Mello, S. K. (2016). Automatic teacher modeling from live classroom audio. *Proceedings of the 2016 Conference on User Modeling Adaptation and Personalization*, 45–53. ACM.

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Prieto, L. P., Sharma, K., Rodríguez-Triana, M. J., & Dillenbourg, P. (2016). Teaching Analytics: Towards Automatic Extraction of Orchestration Graphs Using Wearable Sensors. *Proceedings of the 6th International Conference on Learning Analytics and Knowledge (LAK 2016)*, 148–157. <https://doi.org/10.1145/2883851.2883927>

Scherer, S., Worsley, M., & Morency, L. P. (2012). 1st international workshop on multimodal learning analytics. *14th ACM International Conference on Multimodal Interaction, ICMI 2012*.

