LAK20 Workshop: CrossMMLA in practice: Collecting, annotating and analyzing multimodal learning data across spaces

Call for Papers v01 - November 14, 2019

Workshop website will be available here: http://crossmmla.org/

Tuesday, March 24, 2020 @ LAK20

Workshop Plan

This workshop continues a recently-established but already very consistent tradition of workshops on MMLA and CrossLAK, at both at EC-TEL and LAK. These past events have leveraged a variety of formats, from hands-on learning experiences and tutorials, based on participant contributions/papers, as well as conceptual and community-building activities (which have eventually led to the creation of a Special Interest Group within SoLAR.

Prior to the workshop, we will launch a call for submissions that will shape the hands-on activities to be performed in the workshop. The submissions should include one or more of the following contributions:

1. Data gathering setups and prototypes (e.g., the use of the Multimodal Learning Hub)
2. Data analysis/annotation methods and tools (e.g., Visual Inspection Tool and coding schemas)
3. Learning activities/Pedagogical designs that could benefit from CrossMMLA techniques
4. Examples of CrossMMLA research designs or case studies

Once submissions are accepted, teams will be formed to engage in different CrossMMLA projects during the workshop. These teams will use the aforementioned submissions to define a learning scenario or learning activities to be performed, the

research questions to be investigated through the use of CrossMMLA, and the data gathering, annotation and analysis to be undertaken during the workshop.

Important Dates (based on LAK'20 timeframe)

- 29 October 2019: Workshop call for participation announced
- 3 December 2019: Workshop papers submission deadline
- 9 January 2020: Notifications sent out
- 7 February 2020: Final version of paper due for LAK Companion Proceedings

Workshop Plan (Tentative)

Time	Activities
9-10	Lighting talks of CrossMMLA projects - The Building Blocks
10-12	"Demothon" for data collection from learning activities
13-15	Data processing from the above activities
15-17	Demo Project reporting and Roundtable

1. The morning will open with very short "lightning talks" introducing the CrossMMLA projects that each team will undertake, using the different submissions as building blocks for their MMLA process.
2. In the morning, participants will work in table-teams formed by an initial "team seed" (participants with submissions used as building blocks of the CrossMMLA project), plus additional participants without a submission, added dynamically to the teams in a "demothon" style. The teams will setup the data gathering technology, perform examples of the learning activities, and gathering of data from them
3. In the afternoon, teams process the data recorded in the morning, using their selected data analysis/annotation methods (or exploring new ones) to answer their driving research questions

4. To wrap-up the workshop, each team will present their progress in the CrossMMLA project, and a round table will outline the challenges detected or made apparent during the workshop activities, and will define joint post-workshop actions interesting for the community (within the framework of the SIG): joint experiments to further develop the mini-projects of the workshop, joint open datasets to be created, joint papers or special issues, funding project proposals, etc.

Planned Outcomes

Aside from the (intangible, but very important) learning of participants about CrossMMLA, and the strengthening of the SoLAR Special Interest Group (SIG) on CrossMMLA, the workshop will have two tangible outcomes:

1. Based on the contributions of the participants (see workshop format above) we aim to provide a catalogue of shared community knowledge (to be made available through the SIG/workshop website), about the 1-4 contributions above.
2. Based on the learning activities tested in the workshop, and the rest of the hands-on activities, an open "CrossMMLA dataset" will be made available to the community (through the SIG/Workshop website or other European open science repositories)

At the end of the workshop, it is expected that participants:

- Know the state-of-the-art ideas, designs and implementations of CrossMMLA systems
- Capture, analyze and report multimodal data capture on-the-spot
- Participate in a research agenda for the future of CrossMMLA

Organizers

- Michail Giannakos, NTNU, Norway
- Daniel Spikol, University of Malmö, Sweden
- Inge Molenaar, Radboud University, The Netherlands
- Daniele Di Mitri, Open University, The Netherlands;
- Kshitij Sharma, NTNU, Norway
- Xavier Ochoa, New York University, NY, USA

- Rawad Hammad, University of East London, UK

Workshop Background

The field of multimodal learning analytics (MMLA) is an emerging domain of Learning Analytics and plays an important role in expanding Learning Analytics goal of understanding and improving learning in all the different environments where it occurs. The challenge for research and practice in this field is how to develop theories about the analysis of human behaviors during diverse learning processes and to create useful tools that could that augment the capabilities of learners and instructors in a way that is ethical and sustainable. CrossMMLA workshop will serve as a forum to exchange ideas on how we can analyze evidence from multimodal and multisystem data and how we can extract meaning from these increasingly fluid and complex data coming from different kinds of transformative learning situations and how to best feedback the results of these analyses to achieve positive transformative actions of those learning processes. CrossMMLA aims at helping learning analytics to capture students' learning experiences across diverse learning spaces. The challenge is to capture those interactions in a meaningful way that can be translated into actionable insights (e.g., real-time formative assessment, post reflective reviews; Di Mitri et al., 2018, Echeverria et al., 2019) .

MMLA uses the advances in machine learning and affordable sensor technologies (Ochoa, 2017) to act as a virtual observer/analyst of learning activities. Additionally, this virtual nature allows MMLA to provide new insights into learning processes that happen across multiple contexts between stakeholders, devices and resources (both physical and digital), which often are hard to model and orchestrate (Scherer et al., 2012; Prieto et al., 2018). Using such technologies in combination with machine learning, LA researchers can now perform text, speech, handwriting, sketches, gesture, affective, or eye-gaze analysis (Donnelly et al., 2016; Blikstein & Worsley, 2016, Spikol et al., 2018), improve the accuracy of their predictions and learned models (Giannakos et al., 2019) and provide automated feedback to enable learner self-reflection (Ochoa et al, 2018). However, with this increased complexity in data, new challenges also arise. Conducting 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 (Di Mitri et al., 2018).

This full-day event will provide participants with hands-on experience in gathering data from learning situations using wearable apparatuses (e.g., eye-tracking glasses, wristbands), non-invasive devices (e.g., cameras) and other technologies (in the

morning half of the workshop). In addition, we will demonstrate how to analyze/annotate such data, and how machine learning algorithms can help us to obtain insights about the learning experience (in the afternoon half). The event will provide opportunities, not only to learn about exciting new technologies and methods, but also to share participants' own practices for MMLA, and meet and collaborate with other researchers in this area.

References

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