1st International Workshop on Multimodal Learning Analytics

[Extended Abstract]

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ABSTRACT

This summary describes the 1st International Workshop on Multimodal Learning Analytics. This area of study brings together the technologies of multimodal analysis with the learning sciences. The intersection of these domains should enable researchers to foster an improved understanding of student learning, lead to the creation of more natural and enriching learning interfaces, and motivate the development of novel techniques for tackling challenges that are specific of education.

Categories and Subject Descriptors

H.4 [**Information Systems Applications**]: Miscellaneous; K.3 [**Computers and Education**]: General

Keywords

Multimodal Learning Analytics, Machine Learning, Statistical Analysis

1. INTRODUCTION

Multimodal learning analytics, learning analytics, and educational data mining all are emerging disciplines concerned with developing techniques to more deeply explore unique data in educational settings. They use the results based on these analyses to understand how students learn. Among other things, this includes how they communicate, collaborate, and use digital and non-digital tools during learning activities, and what the impact of these tools is on acquiring new skills and knowledge. Past research on learning analytics has aimed to model studentsâĂŹ knowledge and motivation during learning, to contribute to understanding learning dynamics during computer-supported and collaborative exchange, to diagnose studentsâĂŹ failure to progress during learning activities, and to adapt learning activities to studentsâĂŹ limitations and learning status. More generally, advances in learning analytics are expected to contribute new empirical findings, theories, methods, and metrics for understanding how students learn. They also can contribute to improving pedagogical support for studentsâĂŹ learning through assessment of new digital tools, teaching strategies, and curricula.

The most recent direction within this area is multimodal learning analytics, which emphasizes the analysis of natural rich modalities of communication during situated learning activities. This includes studentsâĂŹ speech, writing, and nonverbal interaction (e.g., gestures, facial expressions, gaze). A primary objective of multimodal learning analytics is to analyze coherent signal and activity patterns in order to uncover entirely new learning-oriented phenomena. Another is to develop a better collection of converging metrics for learning-related behavior and landmarks. These include metrics that eventually could be analyzed unobtrusively, continuously, automatically, and in natural classroom environments and mobile settings.

Progress in these areas will transform our ability to identify and stimulate effective learning, support more rapid feedback and responsive intervention, and facilitate learning in more diverse students and contexts.

2. KEYNOTE SPEAKERS

Prof. Sharon Oviatt (Incaa Designs) She is internationally known for her work in human-centered interface design and evaluation, educational interfaces, mobile interfaces, and pen, speech, and multimodal interfaces. She has been a lifelong educator and prolific scientist, with over 130 scientific publications in a wide range of venues. In 2000, she received a National Science Foundation Creativity Award for pioneering research on interfaces.

Prof. Paulo Blikstein (Stanford University) He is an Assistant Professor at the Stanford University School of Education and (by courtesy) the Computer Science department. He directs the Transformative Learning Technologies Lab which focuses on researching how new technologies can deeply transform the learning of science, engineering, and mathematics. His work involves cutting-edge, multi-modal technologies for constructionist learning environments where students learn science and mathematics by building sophisticated projects and devices. Paulo is a recipient of the prestigious NSF Early Career Award and is also the director of the Lemann Center for Educational Entrepreneurship and Innovation in Brazil.

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