



Keynote : Jean-Michel Boucheix & Ric Lowe

Making complex dynamic content more comprehensible: Challenges and opportunities.

Providing complementary graphic accompaniments to explanatory text has long been considered an effective way to address challenges involved in fostering comprehension of subject matter that changes over time. To date, most multimedia research has been restricted to exploring effective ways of combining these two types of representation with little consideration of how such graphic complements are designed. This presentation uses theoretical and empirical findings to argue that designs based on a deeper understanding of how people process graphic representations of complex dynamics offer rich but as-yet largely untapped opportunities to improve the effectiveness of multimedia learning materials.

About Ric Lowe

Ric Lowe is an Adjunct Professor at Curtin University (Australia) and a Visiting Professor at the Université Bourgogne (France). Prior to entering academia, he worked as an industrial chemist, a science educator and as an instructional designer. While developing learning materials for an innovative physical science course, he became interested in the possibility of using graphics as an alternative to the traditional reliance on specialist scientific language and mathematics for explaining complex technical information. Upon finding a dearth of research on principled design of graphic explanations, he undertook doctoral studies on the perceptual and cognitive processing of technical diagrams. His subsequent exploration of the potential of animations to provide more effective explanations of dynamic systems than static graphics prompted a realisation that animated graphics could pose their own distinctive challenges for learners. This led to a long and most fruitful collaboration with Professor Jean-Michel Boucheix centred on fine-grained investigations of how learners process explanatory animations. A major outcome of this collaboration is the Animation Processing Model (APM) that offers the first detailed theoretical account of animation processing. Ongoing development of the APM informed by successive empirical studies challenges prevailing animation design orthodoxies, suggests principled approaches for developing comprehensible animations, and reveals potential implications for the design of explanatory graphics more generally.

About Jean-Michel Boucheix

Jean-Michel Boucheix is Professor Emeritus of Cognitive Psychology at the University Bourgogne Europe and a member of LEAD (Laboratory for the Study of Learning and Development, French National Centre of Scientific Research) in Dijon. He completed a PhD in developmental psychology at the University of Poitiers, entitled « Communication of spatial relations and semantic development in young children ». A surprising result was the ability of very young children to use perceptual analogies to describe complex spatial actions. He began working as a psychologist in continuing professional training before obtaining a position as a lecturer (assistant professor) and then full professor (habilitation) at the University Bourgogne Europe. His research activities use experimental psychology methods and are primarily focused on the perceptual and cognitive processes involved in the comprehension of complex dynamic visual information (animations and videos), sometimes including multimodal information. The final goal is to improve complex animation design and presentation and to investigate relevant learner's guidance, to tackle prevailing dynamic visualization design foundations, in order to foster accurate mental models building. Jean-Michel Boucheix interest in the study of technologies for learning and training lead also to a recent series of experiment using Virtual Reality focused on strategies for enhancing learning performance with perceptually rich displays. Research was applied to the design and testing of simulation environments for learning. On methodological aspects, he is specialized in using on line-eye movements techniques (recently synchronized with fNIRS) during the processing of dynamic visualizations, multimedia documents and visual scenes. A small side research topic concerned the effect of testing strategies to improving learning of lines for theatrical role-playing. Jean-Michel Boucheix also enjoyed teaching. He was the director of a master's program in psychology in cognitive learning engineering for many years.