
Temporal loci and mixed reality: an experiment in diversifying visualizations of time and space

Celeste Tường Vy Sharpe

csharpe@carleton.edu

Carleton College, United States of America

Sarah Calhoun

scalhoun@carleton.edu

Carleton College, United States of America

Andrew Wilson

awilson@carleton.edu

Carleton College, United States of America

This poster explores ways to use augmented reality to represent complex notions of temporality. Calls for diversifying the digital humanities by scholars like Alan Liu, Amy Earhart, Jessica M. Johnson, and Adeline Koh have called attention to the ways in which digital humanities inquiry and tools often struggle to represent diverse artifacts, cultures, and experiences. Spatial inquiry is one area where scholars are critically engaging and presenting layered analyses of space. Temporality, on the other hand, has received significantly less attention. Notions of time vary widely across cultures. Temporal metadata in digital humanities projects such as timelines or visualizations, however, is frequently constrained by the narrow, linear Gregorian conception of time crystallized by the International Organization for Standardization standard 8601 ([ISO 8601](#)).

Using Keith Basso's description of temporal loci of events from his 1996 book *Wisdom Sits in Places*, we can see how myth ("in the beginning"; atemporal) and saga ("modern times"; time described by ISO 8601) frequently overlap and intertwine with each other (50). For instance, in the Thai Buddhist temple paintings that Sandra Cate describes in her 2003 book *Making Merit, Making Art* ("The Defeat of Mara and The Enlightenment (Panya)," plate 10) we can see the convergence of multiple different conceptions of time. One

striking piece of a mural captures a moment in time after the recently enlightened Buddha defeats the demon Mara, and a cleansing flood washes away the Mona Lisa and a space shuttle. Attempting to fit the complicated relationships displayed in this image into a simple Dublin Core temporal coverage field would be quite difficult, if not impossible.

We identify two main problems that this initial experiment will address. The first is the issue of visualizing multiple temporalities. Our motivating questions are: what are the visual and spatial relationships between the chronological story of the Buddha defeating Mara given how some Buddhists believe that the Buddha is personal and eternal and always present throughout time? How is that expressed in the mural through a wide range of artistic styles and historical references? These questions will be answered through the course of our research.

The second problem is a more practical question of how to use augmented reality to further research and teaching of these complex cultural concepts when both the visual and technical resources are limited. We intend to use the extant low-res photographs available of the "Defeat of Mara" temple mural and Vuforia to create a cross-platform experience of the religious expression. This will allow users to see and select individual elements in the mural (such as the Mona Lisa or the spaceship) and engage with the different ways one can order and make meaning out of the varied chronologies and temporal references. Vuforia allows us to use an existing framework that has the benefit of being accessible on multiple platforms. We believe this is necessary for facilitating the adoption of augmented reality for classroom and preliminary research uses.

Our poster will outline our theoretical framework, detail our development process using the augmented reality framework Vuforia, and provide possible avenues for further lines of inquiry and applications for temporal visualizations. We'll include static images of the AR experience, as well as ways to access our project remotely.

Davisson and Germer Experiment, for the first time, proved the wave nature of electrons and verified the de Broglie equation. The results established the first experimental proof of quantum mechanics. Let's find out more.Â Davisson and Germer Experiment, for the first time, proved the wave nature of electrons and verified the de Broglie equation. de Broglie argued the dual nature of matter back in 1924, but it was only later that Davisson and Germer experiment verified the results. The results established the first experimental proof of quantum mechanics. In this experiment, we will study the scattering of electrons by a Ni crystal. Let's find out more. Suggested videos. Mixed Reality (MR) visual displays, a particular subset of Virtual Reality (VR) related technologies, involve the merging of real and virtual worlds somewhere along the 'virtuality continuum' which connects completely real environments to completely virtual ones. Augmented Reality (AR), probably the best known of these, refers to all cases in which the display of an otherwise real environment is augmented by means of virtual (computer graphic) objects. The method of loci (loci being Latin for "places") is a strategy of memory enhancement which uses visualizations of familiar spatial environments in order to enhance the recall of information. The method of loci is also known as the memory journey, memory palace, or mind palace technique. This method is a mnemonic device adopted in ancient Roman and Greek rhetorical treatises (in the anonymous *Rhetorica ad Herennium*, Cicero's *De Oratore*, and Quintilian's *Institutio Oratoria*). Many memory contest