

## Haptic Cycle: Designing Enhanced Museum Learning Activities

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**Abstract :** Museums enhance their potential by adopting new technologies and techniques to appeal to more visitors and engage them in creative and joyful activities. In this study, the Haptic Cycle is presented, a cycle of museum activities proposed for the development of museum learning approaches with optimized effectiveness and engagement. Haptic Cycle envisages the improvement of the museum's services by offering a wide range of activities. Haptic Cycle activities make the museum's exhibitions more approachable by bringing them closer to the visitors. Visitors can interact with the museum's artifacts and explore them haptically and sonically. Haptic Cycle proposes constructivist learning activities in which visitors actively construct their knowledge by exploring the artifacts, experimenting with them and realizing their importance. Based on the Haptic Cycle, we developed the HapticSOUND system, an innovative virtual reality system that includes an advanced user interface that employs gesture-based technology. HapticSOUND's interface utilizes the leap motion gesture recognition controller and a 3D-printed traditional Cretan lute, utilized by visitors to perform various activities such as exploring the lute and playing notes and songs.

**Keywords :** haptic cycle, HapticSOUND, museum learning, gesture-based, leap motion

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