

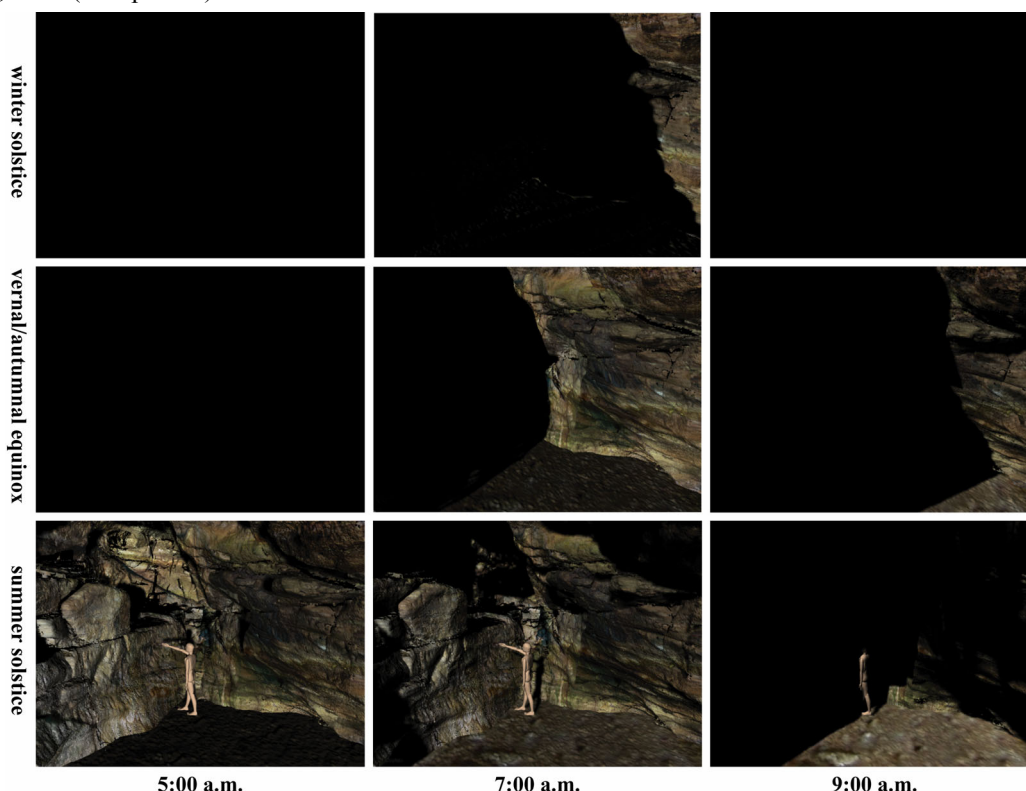
Digital Tumulus/Caves Project

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We are trying to construct the 3D digital model of painted or carved tumulus/caves in the computer graphics in order to restore their real appearance by using 3D laser measurement and texture mapping technology. The restored model is used for the analysis and simulation of the archaeological issues. Now we are particularly paying attention to the lighting simulation inside the tumulus/caves. Archaeologists usually think that ancient painters and sculptors worked inside with an artificial light, such as torch. In case of painted tumulus, maximum 6 colors are used for painting, but it is suspicious whether painters could recognize the difference among those colors inside under such poor light source. We assume that they worked under the brighter light, such as sunshine, and try to reproduce inside appearances according to the position of the sun in the computer graphics. Now we have already simulated the sunshine incidence for the Fugoppe cave and realized that the sunshine was enough coming inside. From this verification, we can possibly make clear some mysteries of the tumulus/caves.

Publication

1. T.Masuda Y.Yamada, N.Kuchitsu, K.Ikeuchi, "Simulating Natural Light Incidence inside Fugoppe Cave by using 3D Measurement Data," 21st Conference on Japan Society for Scientific Studies on Cultural Properties, Mar, 2004.(In Japanese)



This figure shows the simulation result of the direct sunshine incidence inside the Fugoppe Cave. The entrance of the cave is facing due east, so it is dark inside at the daytime. However as seen in this figure, it becomes much brighter inside the cave at the summer solstice than we imagine. So we can conclude that it was possible to carve on the wall under only the sunshine if the sculptor choose the proper season and time. We are planning the lighting simulation under the torch in order to compare the case under the sunshine.