

HOW TO BUILD A TEMPLE: MODERN TOOLS REVEAL THE SECRETS OF INDIAN TEMPLE CONSTRUCTION

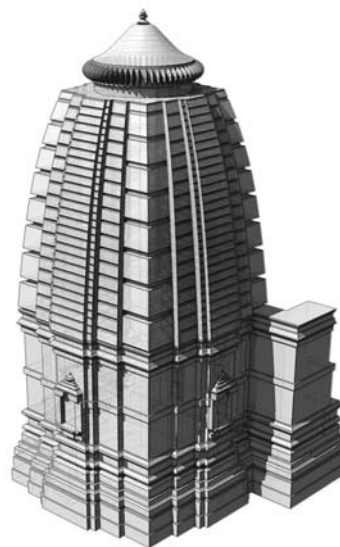
Using a combination of contemporary tools from architecture and engineering, Dr Sambit Datta, of the School of Architecture and Building at Deakin University, is slowly uncovering the secrets of the Indian temple building tradition, which spans Asia from Afghanistan to Vietnam.

“Indian temple architecture is a very old tradition of building dating from the first and second centuries AD right up to modern times. It really flourished in the period spanning the 5th to 12th centuries,” says Sambit. “There is a whole tradition of building in different materials including stone, timber and brick, and a large range of styles, with many cultures and traditions influencing the local architecture.”

Sambit compares it to the European cathedral building tradition of the last 1000 years, but says that unlike European building, few plans and records of the process have survived. Many of the temples have been lost too.



Temple of Ranakdevi, built in 960 AD
Image: Sambit Datta



Reconstruction of the temple using computer-aided techniques
Image: Gregory Pitts, PhD student, Deakin University



“We have found it very difficult to represent the temples in typical architectural plans and models due to the range of styles and structures and the lost knowledge,” he says. “Many of them are in ruins and quite difficult to access.”

To overcome these hurdles, Sambit has turned to powerful computer modelling tools, such as photogrammetry, which allows geometric properties to be determined from photographs, and laser scanning, which captures the form of the temple.

Then, using computer assisted tools to reconstruct the basic geometry of the temple structures and fill in gaps, a virtual model of the temple can be constructed, and an immersive virtual environment developed which allows the researcher to “enter” the temple and see the structures and spaces from different perspectives.

The insights gained from the reconstructions provide a valuable resource for architectural historians interested in comparing temples from different regions of the Indian sub-continent and South East Asia, as well as comparing temples from different periods and with different adaptations to local culture and traditions.

And from a heritage perspective, documenting and reconstructing temples is a valuable step toward conserving sites of historical interest, and planning for development and tourism.

Sambit says the research draws on both the arts and sciences, with its need to understand the local historical and cultural context of the temple as well as the use of contemporary analytical techniques. “It combines art and science in creative ways,” he says.

One of the surprises of Sambit’s research has been the sophisticated use of geometric forms in ancient temples.

“Even though these temples were built 1000 to 1500 years ago, we have found very sophisticated geometric ideas in the layout and construction, such as the infinity series of geometric forms found in a tenth century temple in Western India” he explains. “It demonstrates the depth of scientific knowledge that must have been understood by the temple designers and builders.”

And just as modern architecture combines global trends with local influence, the researchers have observed that local traditions and cultural values have been incorporated into regional interpretations of Indian temple structure.

“The design of the Angkor Wat temples and other Cambodian temples originated in India. But Khmer culture and Angkorean traditions of building are very much dominant,” Sambit notes. “But what we are now wondering is whether the ideas flowed in one direction, from India, or whether there was a two way flow.”



FURTHER INFORMATION:

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