One-day Workshop on 'Fundamentals and Applications of Imaging Techniques in Archaeology'

Resource person: Dr Gargi Jani, Forensic Odontologist and Project Lead, National Forensic Sciences University, Gandhinagar.

Organised by Sharada Channarayapatna (Assistant Professor, Discipline of Archaeological Sciences, Depts of Earth Sciences and HSS), and Camellia Biswas (PhD candidate, HSS) from the Archaeological Sciences Centre, IIT Gandhinagar, Gujarat- 3823055.

Dates: April 21, 2024

Venue: AB 1/201, IIT Gandhinagar, Gujarat

Introduction

Archaeologists and anthropologists often use medical imaging techniques like computed tomography (CT), magnetic resonance imaging (MRI), and 2D radiographs (X-ray images) for examining remains due to their non-invasive nature and ability to produce detailed information and images from different angles. The remains can be both organic (human/animal skeletons and/or plants) or inorganic (artefacts). These cutting-edge techniques assist an expert in many ways without damaging the remains, such as identifying post-mortem alterations and certain characteristic traits to determine the age at death, cause of death or any pathology/disease present in the skeleton of a dead individual. For instance, they have been efficiently and extensively used in studying Egyptian mummies. Further, they can assist in identifying any artefacts buried with them. Virtual models can be generated from these scans, which may aid the expert in visualising the evidence in question from three dimensions. The 3D models can be 3D printed for better visualisation and tactile examination. The models generated using CT scans can also be used to reconstruct fragmented remains. Using medical images can greatly benefit archaeologists and anthropologists by allowing them to access and examine the evidence with minimum touch.

Objectives

- The workshop will give the participants an overview of different palaeo-radiological techniques that can be employed to examine archaeological remains, mainly skeletal remains, and how to interpret the findings.
- The participants will get hands-on experience reading the radiographs of X-rays and CT scans. Upon completing the workshop, they can identify the remains' normal landmarks and different pathologies. Additionally, they can identify the age-related markers on the skeletal remains.
- During the workshop, the participants will learn to handle, reconstruct and segment the region of interest on 3D image volumes using various software.

- They will also get hands-on experience reconstructing the 3D volumes of fragmented remains using 3D software.

Approach: The workshop will entail lectures and hands-on practical sessions facilitated by the key resource person.

Target audience: This workshop will benefit researchers, graduate and postgraduate students, PhD candidates, teaching faculty, and professionals engaged in archaeology, Physical and Biological anthropology, Forensic Sciences, Radiology, Palaeontology, Museology/Conservation, Biomedical Engineering, History and medicine students.

Deliverables:

- Participants will gain practical experience in examining and interpreting radiographs from different imaging techniques, which they could use in their research on archaeological skeletal remains and artefacts.
- Lecture sessions will provide nuanced insights into paleoimaging techniques, their potential usage in archaeological and anthropological research and discussion of relevant case studies.
- **Certificate of Participation**: Participants will receive certificates acknowledging their involvement in and completion of the workshop, validating their acquired knowledge and skills.

Location Block 1/201

TIME	SESSION TITLE
9.15 to 9.45	Registration
9.45 am- 10 am	Welcome Address by Prof. Sharada Channarayapatna
10 am- 11.00 am	**Lecture 1 : Introduction**
11.00 am to 11.15 am	**Coffee/tea break**
11:15 am to 1 pm	**Lecture with Practical session-1** Analyzing the radiographs
1.00 pm- 2.00 pm	**Lunch break**
2.00 pm- 4.30 pm	**Practical session** on Software usage
4.30 pm- 4.45 pm	**Break**
4.45 pm- 5.30 pm	**Discussion session and Conclusion**
5.30 to 6 pm	Certificate distribution & vote of thanks