Use of Neural Networks in archaeology: preservation of Assamese manuscripts

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Abstract

Historical documents are engraved as manuscripts ranging from palm leaf manuscripts, metal carvings to paper manuscripts. These manuscripts reveal significant information about yesteryear. Although, there are thousands of such manuscripts, the majority of them are not in good condition. Assam has one of the most ancient and largest collections of manuscripts. Assamese 'manuscripts are bound up with Srimanta Sankardeva (15th–16th century Assamese polymath) as well as his Neo Vaisnavite Movement as the manuscripts were the medium of transmission of the ideals of this religio-cultural movement. At the same time, Assamese are grateful to Sankaradeva and his successors for manuscripts which displayed Assamese culture. This saint-scholar, poet and playwright wrote his compositions on these manuscripts. Assamese consider these manuscripts as objects of veneration. Over the years, manuscripts, especially those in print are prone to decay due to various reasons such as climate (light, heat, dust and humidity), pest attacks and theft. At present, Information Technology (IT) is used for preservation of cultural heritage including preservation of manuscripts, the primary source of historical information. Current methods include use of hyperspectral imaging and Optical Character Recognition (OCR) to preserve and scan images to digital format. However, current technologies lack the capability to convert a manuscript to a digital artifact due to improper character identification methodology. As such, Artificial Neural Network (ANN) can be used for classification as well as pattern recognition functions. Therefore, this research paper introduces use of an ANN to identify sections of manuscripts obtained from the Assam region.

Keywords: ***Archaeology, Artificial Neural Networks, Manuscripts, Optical Character Recognition***

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