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Paper Title
Foundation Models for Archaeological Feature Detection: Advances and Prospects

Abstract
To date, Deep Learning models for archaeological feature detection have generally been built on the back of off-the-shelf convolutional neural networks (CNNs) and vision Transformer (ViT) models, which are pretrained on a variety of image types, sources, and subjects that are not specific to analyzing high-resolution satellite imagery. Recent advances in transformer-based vision models and self-supervised training approaches make it possible for researchers to generate foundation models that are more finely attuned to specific domains, without huge amounts of human-annotated training data. We discuss the development of two such models employing Meta's transformer-based DINOv2 framework. The first, DeepAndes, is based on the ingestion of a 3 million chip sample from a two million square km area of high-resolution multispectral satellite imagery of the Andean region. This foundation model has broad utility across the social and earth sciences. The second, DeepAndesArch is fine-tuned labeled archaeological training data collected by the GeoPACHA project to create an archaeology-focused version of DeepAndes. We present the processes involved in generating DeepAndes and DeepAndesArch and discuss prospects for foundation models in archaeological research.

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Authors
Junlin Guo (Vanderbilt University) <junlin.guo@vanderbilt.edu>
Yuankai Huo (Vanderbilt University) <yuankai.huo@vanderbilt.edu>
James Zimmer-Dauphinee (Vanderbilt University) <james.r.zimmer-dauphinee@vanderbilt.edu>
Jordan Nieusma (Vanderbilt University) <jordan.m.nieusma@vanderbilt.edu>
Siqi Lu (Vanderbilt University) <siqi.lu@vanderbilt.edu>
Steven Wernke (Vanderbilt) <s.wernke@vanderbilt.edu>
Nathaniel VanValkenburgh (Brown University) <parker_vanvalkenburgh@brown.edu>