Stonelia Prehistoric Stone Tool Identification Android App for Archaeological Researchers

Perera K B N[1], Pathirana M K[1], Wijayarathna P G R C[1], Hewabathma C D[1], and Nelum Amarasena[1]

[1]Faculty of Computing, Sri Lanka Institute of Information Technology, Sri Lanka.
it19009896@my.sliit.lk, it19073224@my.sliit.lk, it18141948@my.sliit.lk, it19052298@my.sliit.lk, nelum.a@sliit.lk

Abstract

Prehistoric stone tools can be considered one of the oldest artifacts created by ancient humans. Lithic archeology's study of stone tools provides important information about early humans' technologies, agility, and mental and innovative abilities. A vital issue in lithic archeology is the identification and analysis of stone tools found at the excavation sites. Archeologists need to observe and analyze a stone tool under different aspects for a long time to verify whether it is a stone tool or a geofact, the techniques used to create it, and identify its rough relative date and functional value. This can be challenging for amateur scholars studying archeology since it requires a lot of experience and time to identify by a glance. As a solution, Stonelia, a mobile-based android application, can be introduced to identify and analyze stone tools. The images captured through the mobile app are preprocessed using image processing. Using CNN models identifies the stone artifact from a geofact, the mineral type, the rough relative date, techniques used to create the stone artifact, and its functional value. This mobile application provides prompt identification and analysis of stone artifacts within a short time and with higher accuracy.

Keywords

Deep Learning, Convolutional Neural Network (CNN), Image processing, Lithic Archeology, Geofacts, Stone artifacts, Mineral Type, Rough Relative Date, Making Techniques, Functional Value