

## **The automatic recognition of ceramics through only one photo: The ArchAIDE App**

*Francesca Anichini, Nevio Dubbini, Nachum Dershowitz, Barak Itkin, Lior Wolf*

ArchAIDE ([archaide.eu](http://archaide.eu)) is a 3 year project (2016-2019) funded by the European Union's Horizon 2020 research and innovation programme. They have developed a new app that aims to improve the practice of pottery recognition in archaeology, using the latest automatic image recognition technology. Every day, archaeologists are working to discover and tell stories around objects from the past, investing considerable time, effort and funding to identify and characterise individual finds. Characterisation and classification of ceramics are carried out manually, through the expertise of specialists and the use of analogue catalogues held in archives and libraries. The goal of ArchAIDE is to optimise and economise this process, making knowledge accessible wherever archaeologists are working. ArchAIDE supports the classification and interpretation work of archaeologists (during both fieldwork and post-excavation analysis) with an innovative app for mobile (tablets and smartphones) and for desktops, designed to be an essential tool for archaeologists. Using deep learning technology and developing a dedicated neural network, the ArchAIDE app is able to quickly recognise single potsherds through a photo. The fragment is photographed, its characteristics sent to a comparative collection that activates the image recognition system, resulting in a response with all relevant information linked, and ultimately stored, within a database that allows sharing online. Several tools enrich the app facilitating the use to consult digital catalogues, to draw the fragment and to organize data at different sites. The system currently supports shape-based recognition of Terra Sigillata Italica, Hispanica, South Gaulish and Roman Amphorae, and decoration-based recognition of Majolica of Montelupo and Majolica of València, as a proof-of-concept. The ArchAIDE app has been developed by an international team of more than 30 researchers, archaeologists, computer scientists from 5 countries (Italy, Germany, Israel, Spain, United Kingdom).