IMPLEMENTATION OF COMPUTATION CODES IN GEOSTRUCTURAL SURVEYS TO EVALUATE ROCK MASS STABILITY AIMED AT THE PROTECTION OF CULTURAL HERITAGE

Stefano Cardia[1], *Biagio Palma*[2] and *Mario Parise*[1]

[1] Università degli Studi di Bari Aldo Moro, Dipartimento di Scienze della Terra E Geoambientali, Bari, Italy
[2] IDROGEO SRL, Vico Equense, Napoli, Italy

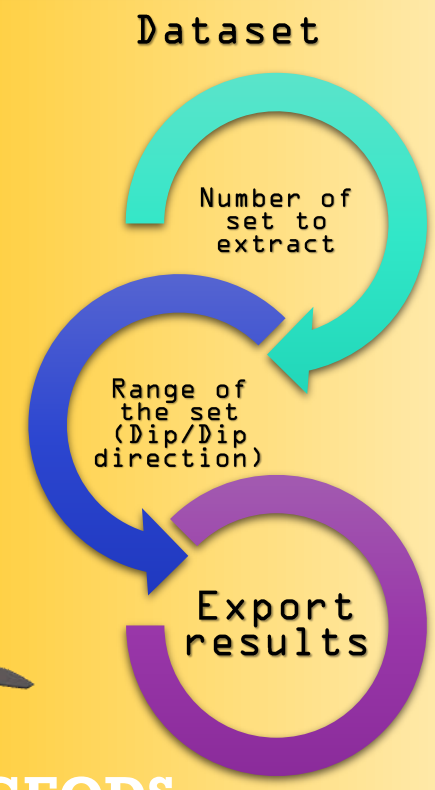
INTRODUCTION

Instability of rock masses is a frequent problem, therefore, issues related to the study of rock masses have always been of primary importance, since their consequences directly affect human lives, causing severe losses to society. In order to identify the areas most susceptible to gravity-related phenomena in such settings, the traditional approaches are often not sufficient, and need to be integrated by new tools and techniques aimed at properly and quantitatively describe the structural arrangement of rock masses. These include the use of close range remote sensing techniques. It is now many years that various attempts have been made to standardize processes to extract volumetric shapes from digital data, in order to individuate geometrical features in point clouds and, eventually, to identify discontinuities on rock outcrops.

AIM

Provide reliable results on the likely instability processes in surface and underground settings by combining observations made in situ with digital results of scanning.

Algorithm for supervised discontinuity extraction

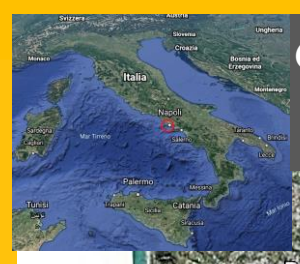


Software GEODS

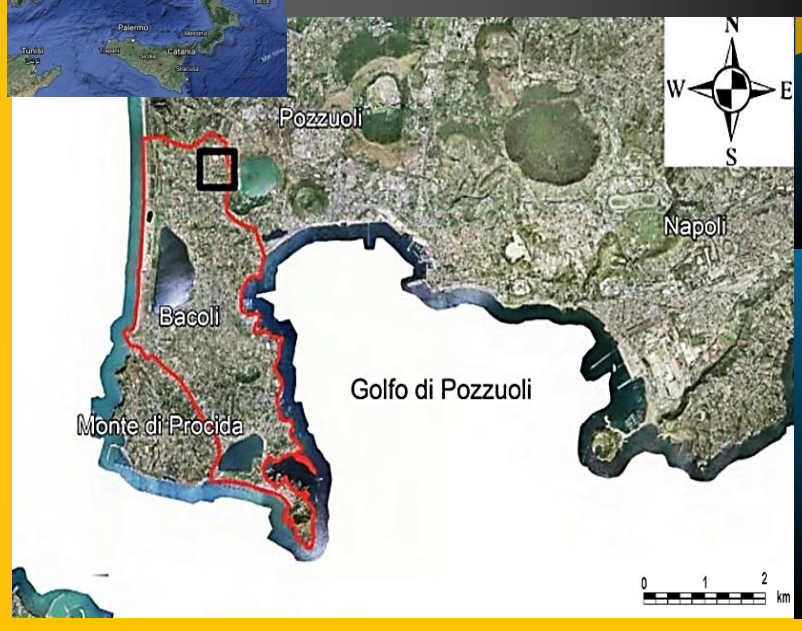
- utilizes the results to represent the rocky surfaces on charts and stereographic projections;
- is able to calculate standard deviation and mean values of the classified clusters.

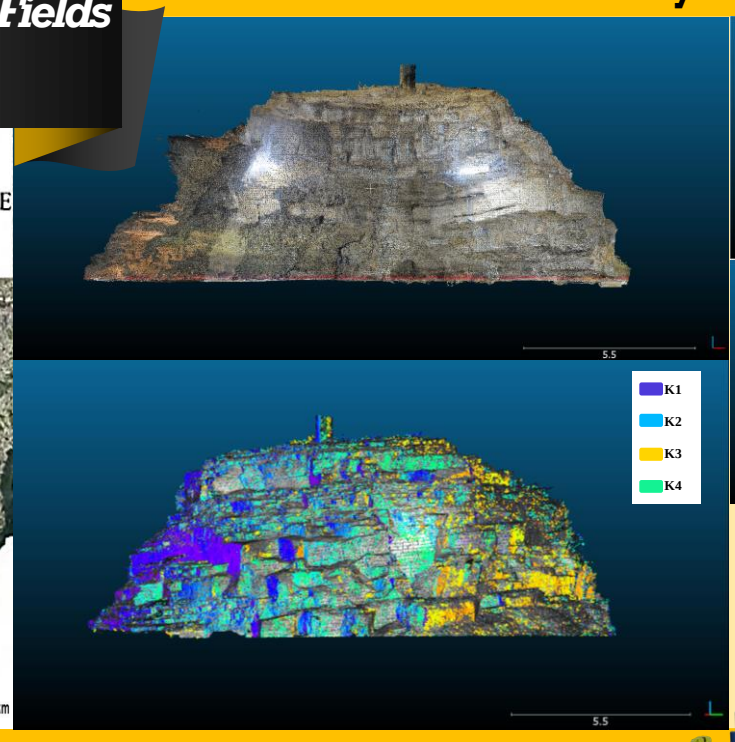
It is useful to identify the density of each identified discontinuity and to evaluate potential kinematics

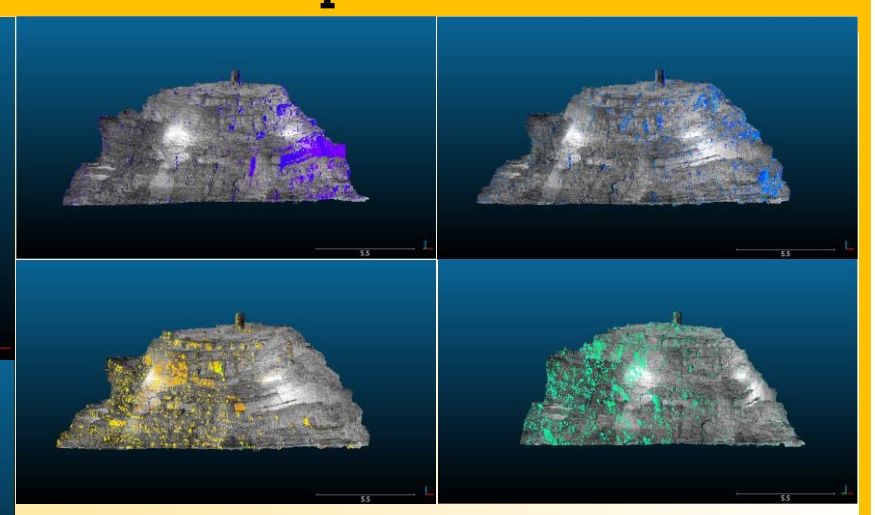
CASE STUDY

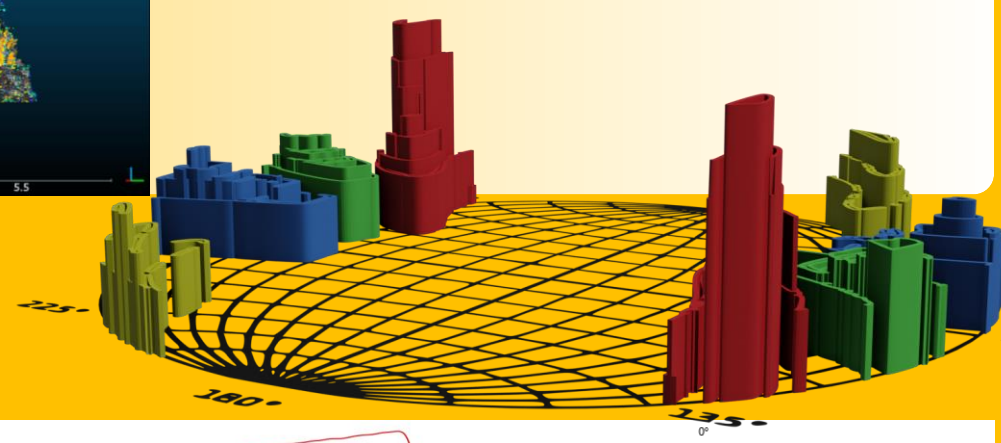


Cocceio cave - Phlegrean Fields Napoli, Italy

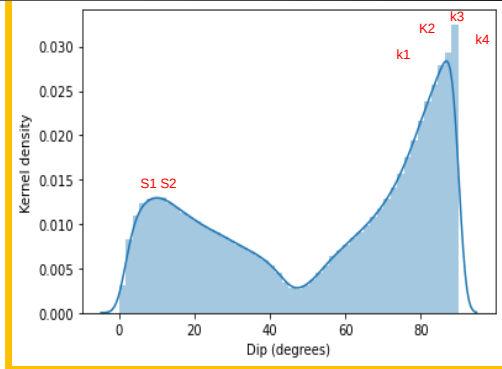


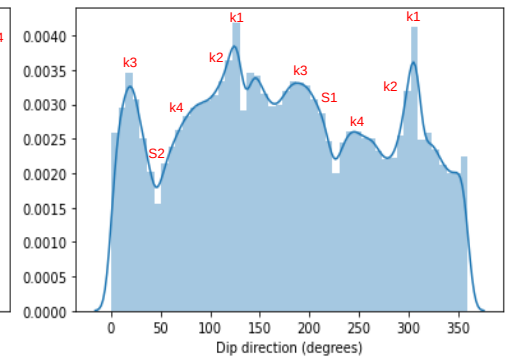


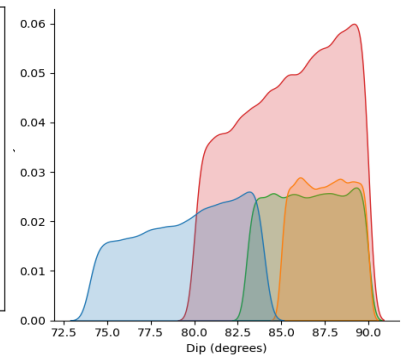


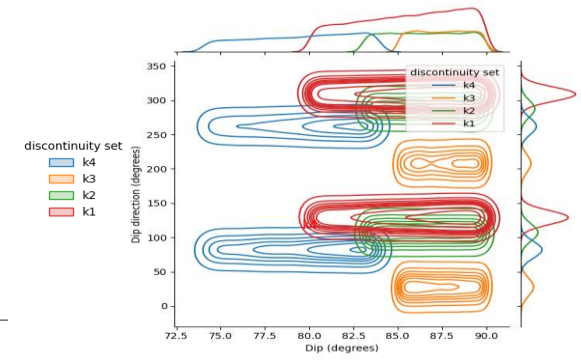


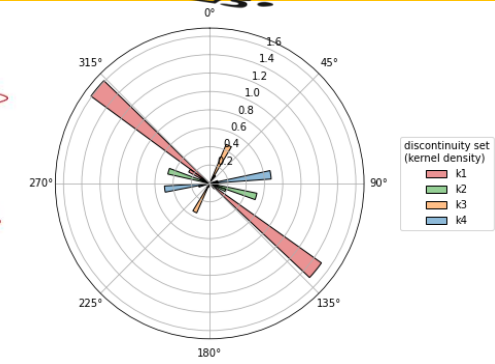
Graphic plot results











1 Density relative to dip

2 Density relative to dip direction

3 Density relative to the dip of the extracted sets

4 Density relative to the dip compared to dip direction of the extracted sets

5 Polar bar chart of the extracted sets

UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO
DIPARTIMENTO DI SCIENZE DELLA TERRA E GEOAMBIENTALI
IdroGeo Progettazione e Servizi per l'Ambiente

stefano.cardia@uniba.it
mario.parise@uniba.it
palma@idrogeo.it

EGU General Assembly 2021