Informatics

Interactive Correlation Panels
for the Geological Mapping of the Martian Surface

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Motivation

In recent years, digital outcrop models have become a popular tool to carry out geological investigations on the computer. These 3D models of outcrops are also created for the exploration of Mars. With specialized software, geologists can annotate geological attributes on digital outcrop models, such as the boundaries between different rock layers.

Geological Annotations on Digital Outcrop Models

After annotating, geologists create logs, a graphic description of the rock layers. To establish a geological model of a larger region, corresponding layers are correlated in multiple logs. The correlated layers of the logs are graphically linked in a correlation panel. Creating correlation panels is very time-consuming, and they are usually created by hand with drawing programs. Due to this restriction, the diagrams are created at the end of the interpretation process, in order to avoid time-consuming editing afterwards. When switching to a drawing program, the connection between the original data and the encoded data in the diagram is also lost.

**Geological Logs and Correlation Panels**

Method

This work is part of a design study with the aim of automating the creation of correlation panels, and turning a static illustration into an interactive application that can be integrated into the interpretation process. In this work, after a short introduction to the exploration of Mars with the help of geology, we analyse published correlation panels to explore the design space of these illustrations. In addition to that analysis we conducted workshops and a research stay at Imperial College London with our domain collaborators. Using the information gained from the analysis and our collaborators, we describe possible design choices, and extract the minimum requirements for a prototype.
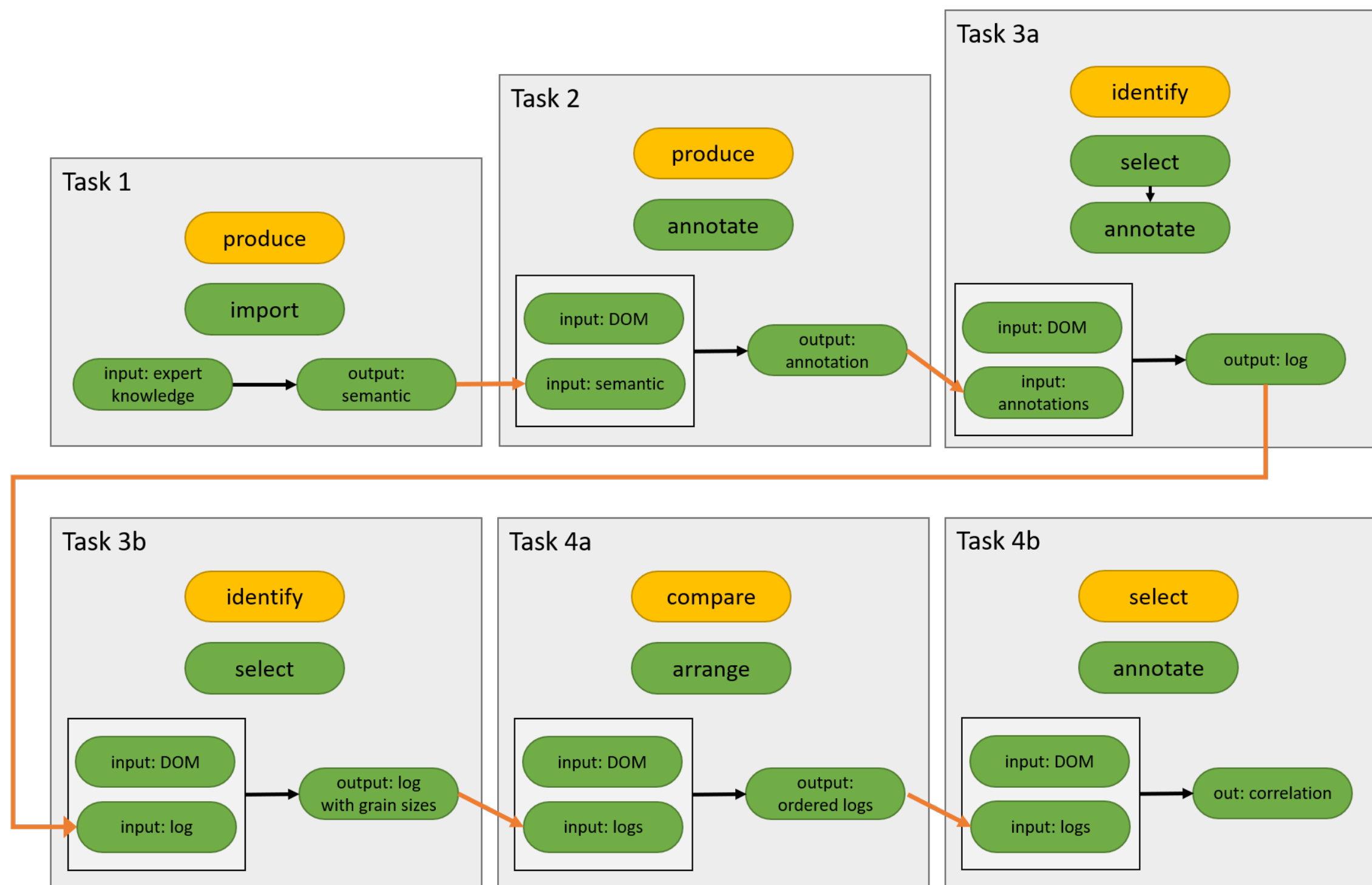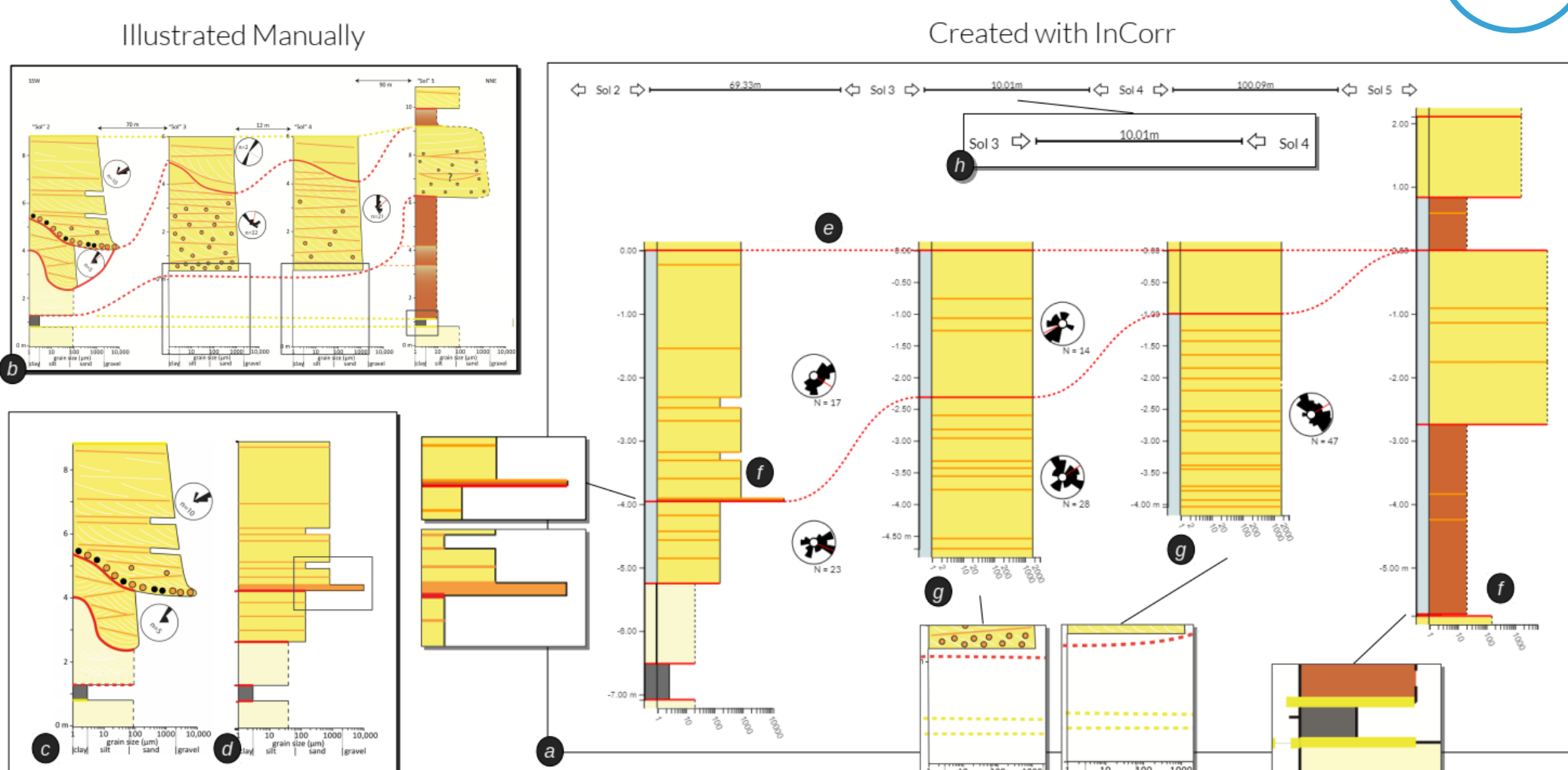
Design Study Methodology
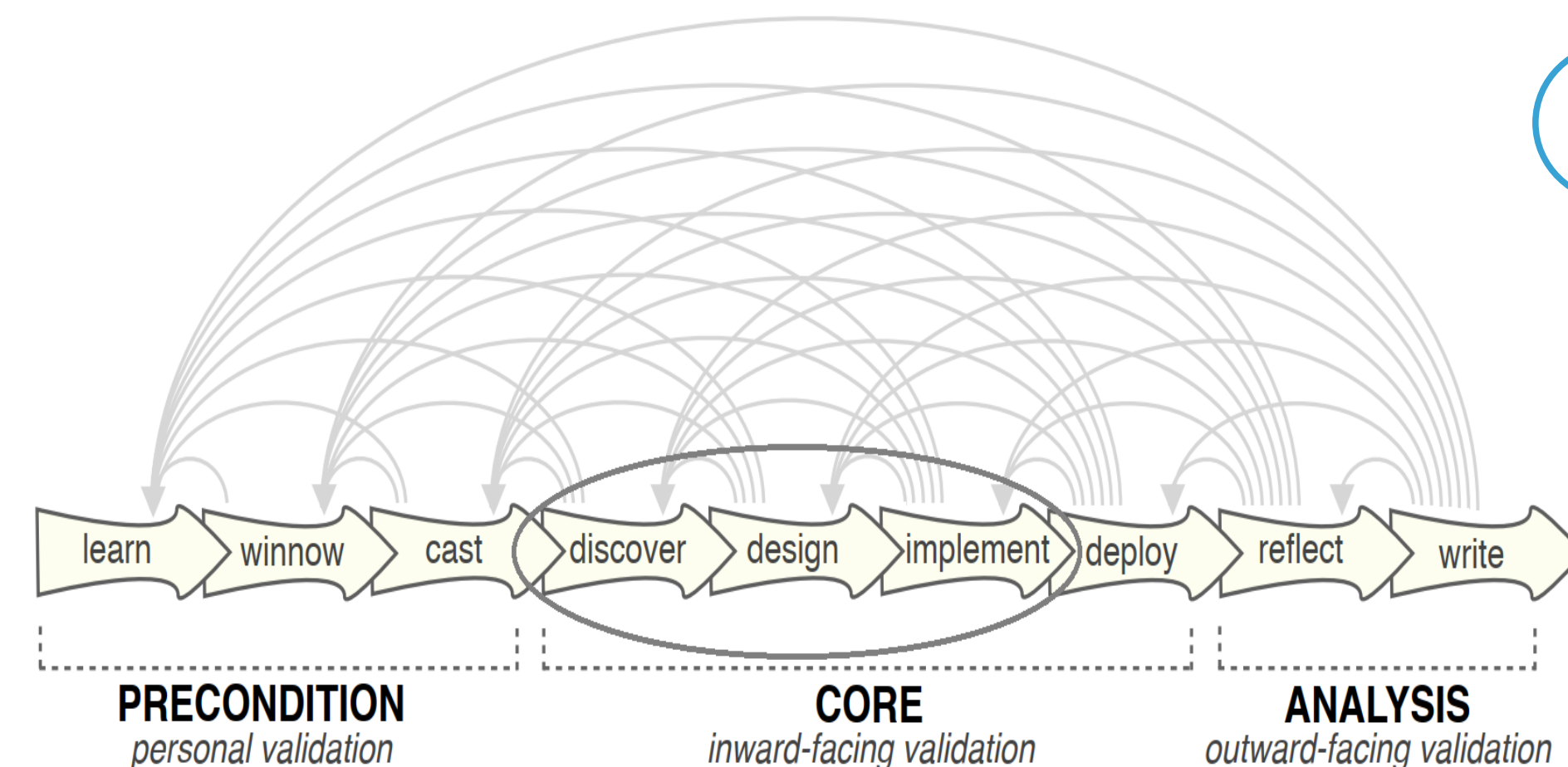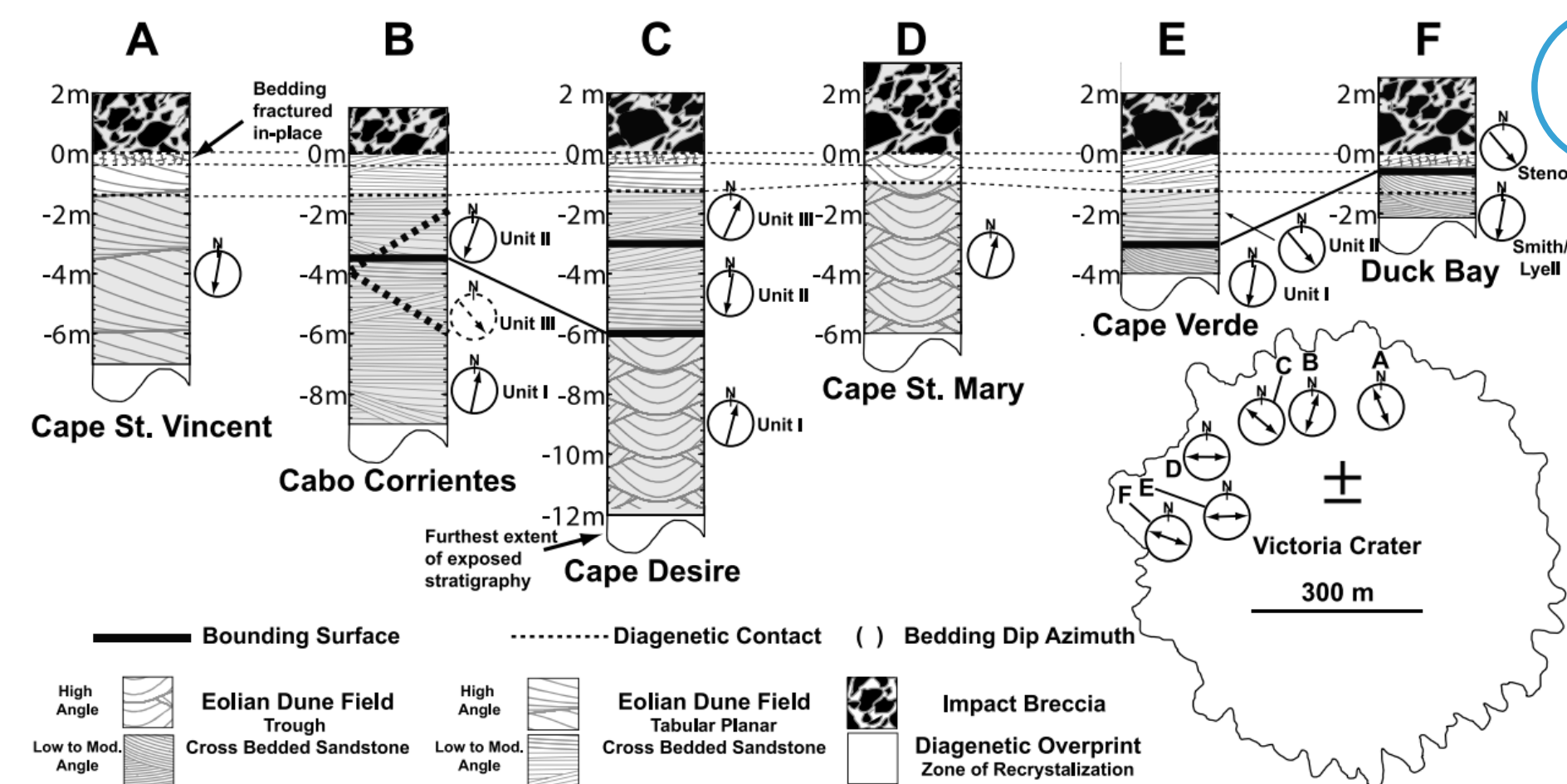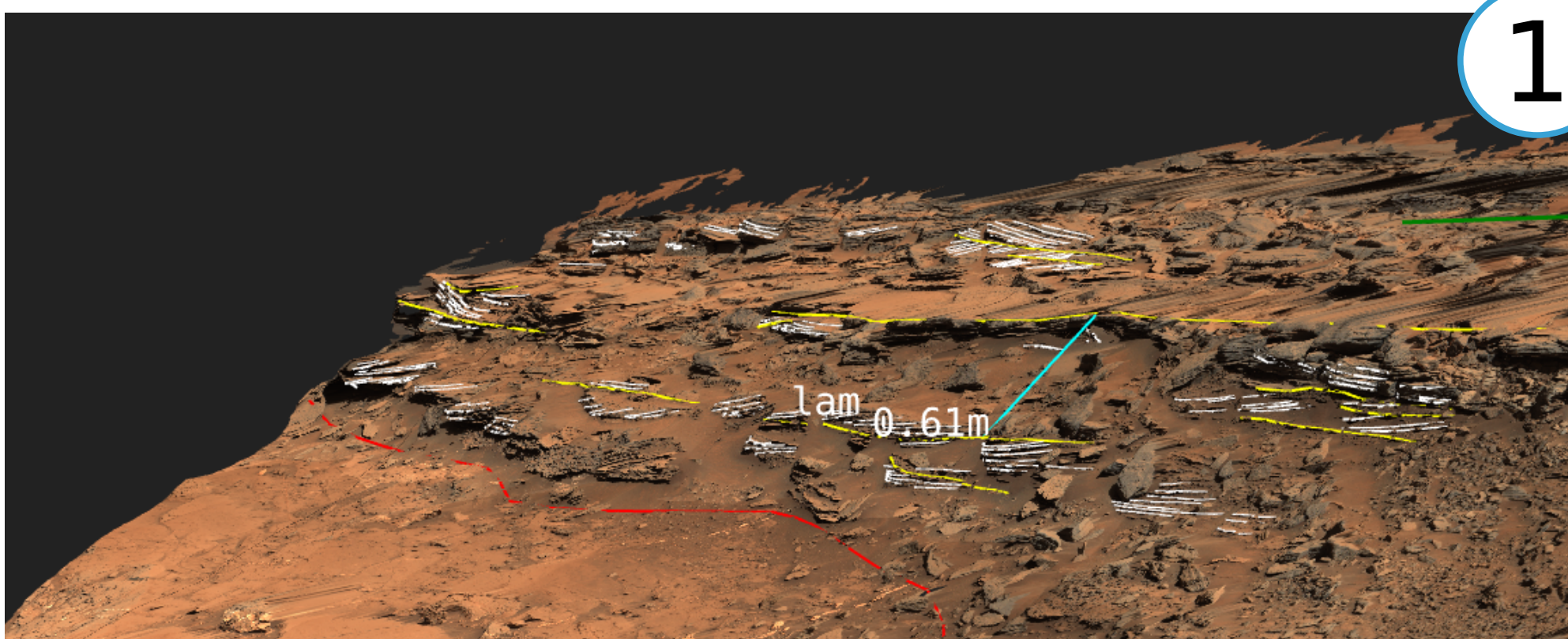
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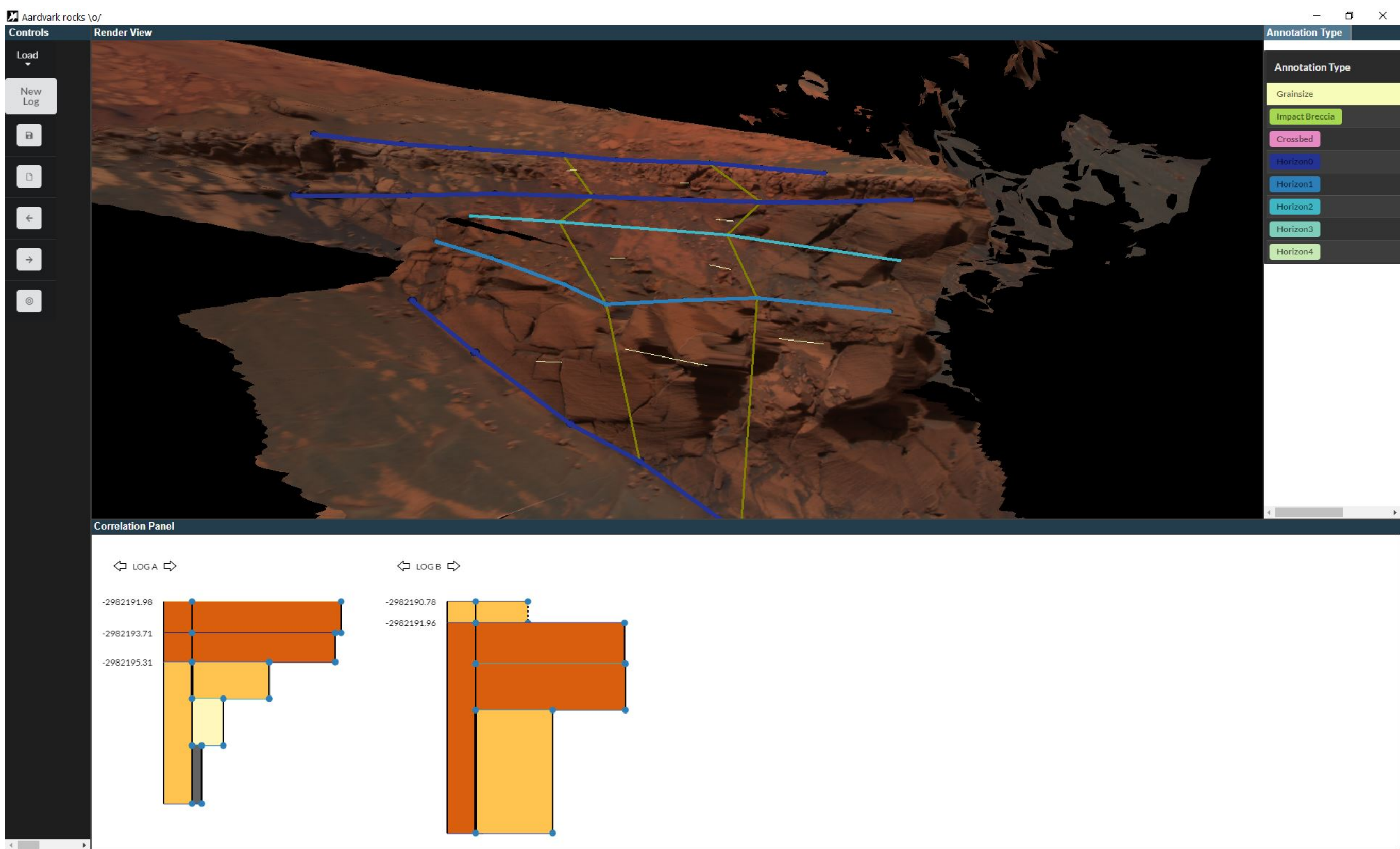
Prototype Implementation

Task Abstraction

Further Work

The prototype created in the course of this work was later extended and presented in a paper that encompasses the whole design study.

Illustrated Manually   Created with InCorr

Bibliography

1 An outcrop loaded in the open-source visualisation tool PRo3D with annotations. PRo3D and the data are available online at pro3d.space, data courtesy of NASA/JPL/ CalTech/ASU, 3D data processing by Joanneum Research.

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