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Integrated Exploration Platform: Software Tools for Integrated Multi-Data Interpretation

Wong, J.C.¹, Holden, E.J.¹, Kovesi, P.¹ and Nathan, D¹

¹Centre for Exploration Targeting, Perth, Western Australia. Corresponding author: jason.wong@uwa.edu.au.

With the increasing quantity, and diversity, of data available for mineral exploration, there is an increasing need for tools to facilitate integration of all the data into a single coherent interpretation. Ongoing collaborative research between the Centre for Exploration Targeting and the Geological Survey of Western Australia aims to address this challenge through the development of the Integrated Exploration Platform (IEP) to support explorers operating in Western Australia.

The IEP is available as an Add-in for ESRI ArcGIS [1], and consists of: multi-data visualisation tools [2] to assist integrated interpretation of different datasets simultaneously; and interpretation support tools [3] to improve interpretation confidence through data evidence assessment of interpreted features. Both of these toolsets are built to facilitate interpreter-driven and computer-assisted workflows, in order to maximise the benefits of both extremes (human intuition and computing power), while minimising the weaknesses (human bias, and algorithm inflexibility and obscurity).

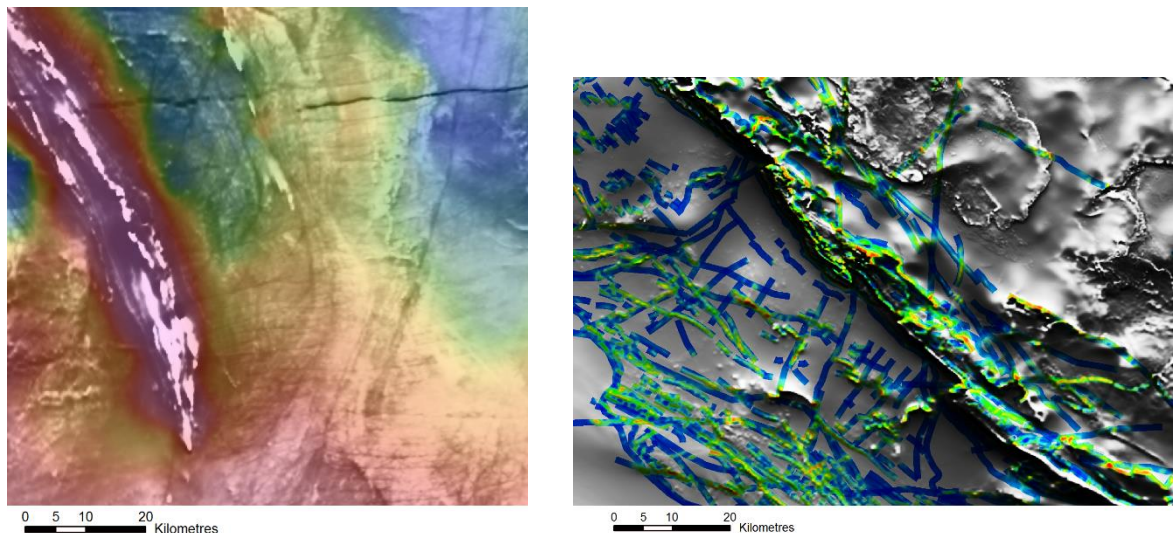


Figure 1: IEP visualisation and interpretation support tools. The left image shows blending visualisation via interactive user manipulation of the blend contribution from gravity data (rainbow) and magnetic data (greyscale). Blending is not limited to two datasets. The right image shows data evidence along user interpreted lines (warmer colours indicating stronger data evidence).

The IEP contains a suite of multi-image blending tools, designed for 2D data such as geophysical data, radiometric data, and ASTER data; as well as utilising blending visualisation techniques for 3D volumetric data. For interpretation support tools, both the visualisation and the quantitative analysis of the feature

evidence provide confidence feedback so that the user may make informed adjustments and improvements to the interpretation, based on the evidence from the data.

References:

[1] The Integrated Exploration Platform (2016) <http://www.WAExplorationPlatform.com>

[2] Kovesi P, Holden EJ and Wong J (2014) *Computers and Geosciences* 72:147–155.

[3] Holden EJ, Wong JC, Wedge D, Martis M, Lindsay M and Gessner K (2016) *Computers and Geosciences* 87:101–111.

