

Advance algorithms used to detect online behaviour trends

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Money laundering and other suspicious behaviours will become more detectable with the refinement of a 2D graphic visualisation tool currently under development at the University of Sydney's Faculty of Engineering and Information Technologies.

Super-fast algorithms that will allow IT security analysts to detect an eclectic range of abnormal behaviours are being created by Professor Seok-Hee Hong.

Professor Hong, who received a Future Fellowship from the Australian Research Council to enhance her work in this area, says technological advances are increasing data exponentially, resulting in massive, complex networks.

Graph drawing, or visualisation, is the science and art of creating good geometric representations of a graph. Good visualisation can amplify human cognition; reveal the hidden structure of a network, and thereby lead to new insights, findings or predictions, says Professor Hong.

Many real world networks can be modelled mathematically as 'graphs'. These include networks that are common to many of us, such as Facebook, Twitter, [LinkedIn](#) and Wikipedia, Professor Hong states.

"The algorithms we are constructing will have the potential to assist police and security specialists to monitor and analyse, for example, mobile telephone calls or internet [social networking sites](#), using 2D

graphs."

"To be used as evidence, these 'graphic visualisations' need to convey information faithfully. We already know that good visualisations have some geometric properties, called aesthetic criteria, including few edge crossings, good area resolution - small area in 2D and small volume in 3D - low curve complexity with few bends per edge, and a high degree of symmetry.

"The challenge we are trying to overcome is the design of a central tool with the clarity and definition to carry out analysis, enabling businesses, researchers and other dataset users to explore datasets to identify patterns, associations or trends," states Professor Hong.

The work being conducted by Professor Hong will also be applicable to biomedical networks such as protein-to-protein interaction biochemical pathways, and gene regulatory networks.

Provided by University of Sydney

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