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Framework for Reliable Experimental Design (FRED): A research framework to ensure the dependable interpretation of digital data for digital forensics.

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Abstract
The establishment of fact forms the cornerstone of any forensic discipline, with digital analysis being no exception. Practitioners are under an obligation as expert witnesses to provide factual accounts of digital scenarios, which must be underpinned by robust knowledge and evidential findings. To achieve this level of reliability, investigatory research must be suitably planned, implemented and analysed in a way which instills confidence in the accuracy of any findings. This is particularly important as digital forensic organisations are now facing the impending requirement to have acquired ISO/IEC 17025 accreditation. This article proposes the Framework for Reliable Experimental Design (FRED) to support those engaged in the field of digital forensics research to contribute reliable, robust findings. FRED focuses on the underpinning procedures involved within undertaking the reverse engineering of digital data structures and the process of extracting and interpreting digital content in a reliable way. The proposed framework is designed to be a resource for those operating within the digital forensic field, both in industry and academia, to support and develop research best practice within the discipline.

Keywords: - Digital forensics; expert evidence; admissibility; research; digital evidence.

Biography
Graeme Horsman is a lecturer in computing at the University of Sunderland, specializing in digital forensics having previously worked as a digital forensic analyst. He has a BSc (Hons) degree in Computer Forensics, a PhD, graduate diploma in law and Masters of Jurisprudence. His research focuses on digital forensic examination techniques, methods for forensically investigating mobile devices, and knowledge-based systems for improving digital forensic examinations and evidence identification.

1 Introduction
As a field, digital forensics (DF) remains in a constant state of change, driven by technological changes. In an effort to prevent the construction of another definition of DF, focus is drawn to Raghavan’s (2013) following characterisation. ‘Digital forensics is a branch of science that involves the application of scientific principles to the investigation of artifacts
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