

## W03 Scientific Working Group on Digital Evidence (SWGDE) and Digital Evidence: The Look of Modern Criminal Investigations

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**Learning Overview:** The goal of this presentation is to provide attendees with an overall view of the various types of digital forensic examinations and technical work being performed by members of SWGDE that can be applied in the attendees' day-to-day work.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by increasing awareness among the general population of forensic scientists of the work in digital forensics and by making digital forensic practitioners aware of the useful resources, guidance, and best practices available from SWGDE.

As technology continues to evolve and morph into new formats and platforms, the challenge of digital and multimedia forensics progresses as well. Digital forensics experiences dynamic changes caused by the rapid progression of technology, new inventions with new applications, and the continued miniaturization and complexity of the technologies arriving to digital forensics labs. While many forensic science disciplines encounter iterative change enabled by new methods and new technologies, digital forensic science encounters revolutionary change across devices and technologies not yet created.

The market forces driving adoption of new technologies heavily affect digital forensic practitioners. As emerging technologies arrive to market, these same new technologies begin to appear in evidence queues to be addressed by forensic practitioners. Similarly, as new technologies such as cloud providers, social media, data storage devices, and market data tracking capabilities become available, digital forensic techniques can be advanced as well in their implementation in existing forensic processes. New methods and research exist in emerging technology areas that can inform discreet problem statements while finding applicability across other new technology as well.

Digital forensic casework faces a continual evolution of technological challenges—challenges emerge daily with how to successfully perform validated forensic examinations on new platforms. The growth in technology and data storage techniques not only work against a digital forensic practitioner, but additionally provide for the development of new capabilities to further their forensic analyses. New forensic methods and best practices are constantly emerging as new types of data and devices that have not yet been previously encountered in forensics labs become commonplace.

The SWGDE is comprised of more than 80 members representing all levels of the digital forensic community who are dedicated practitioners working diligently to provide guidance and best practices to address relevant technological issues. These members have encountered examinations that evolved into unique solutions that will have a positive and important impact on current forensic examinations and will provide valuable solutions.

As new forensic techniques are being researched, developed, and documented as best practices, processes being used to validate these methods must also grow in development and implementation. Garfinkel identified that standardization and validation must be strengthened to meet the challenge coming with future technologies.<sup>1</sup> Lillis et al. identify that future digital challenges in and of themselves can hamper investigations, but the cumulative effect amplifies these difficulties.<sup>2</sup> Caviglione et al. call out the need for multidisciplinary approaches spanning multiple fields to address the future of digital forensics.<sup>3</sup>

After attending this workshop, attendees will be able to: (1) list examples of new emerging technologies and forensic methods used against them, (2) articulate challenges related to the digital forensics of new technologies, (3) discuss methods, processes, and strategies for addressing software testing and validation, and (4) have the opportunity to review existing literature, case studies, and research areas related to forensic and validation challenges.

### Reference(s):

1. S.L. Garfinkel. Digital Forensics Research: The Next 10 Years. *Digital Investigation*, vol. 7 supplement, 2010, pp. S64–S73.
2. Lillis, David; Becker, Brett A.; O'Sullivan, Tadhg; and Scanlon, Mark. Current Challenges and Future Research Areas for Digital Forensic Investigation. (2016). *Annual ADFSL Conference on Digital Forensics, Security and Law*. 6. <https://commons.erau.edu/adfsl/2016/tuesday/6>.
3. L. Caviglione; S. Wendzel; and W. Mazurczyk. The Future of Digital Forensics: Challenges and the Road Ahead. In *IEEE Security & Privacy*, vol. 15, no. 6, pp. 12-17, 2017. doi:10.1109/MSP.2017.4251117.

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### Digital Forensics, Software Validation, Multimedia