

The Impact of Experiential Technologies Upon the Teaching of Evidence Law

Judith Marychurch

© January 2020

Centre for Professional Legal Education

Bond University

14 University Drive Robina QLD 4226 Australia

www.bond.edu.au/cple

AUTHOR

Judith Marychurch

Assistant Dean – Teaching and Learning

Melbourne Law School

University of Melbourne

jmarychurch@unimelb.edu.au

This Report was commissioned by the Bond University Centre for Professional Legal Education as part of the research project ‘The Impact of Emergent Technologies Upon the Teaching of Core Law Units in the Australian Law Curriculum’. The project has Ethics Approval from Bond University: Ethics Reference Number CP01045.

ABOUT THE CENTRE

The Centre for Professional Legal Education is a community of legal educators, researchers, practitioners and administrators who collaborate in defining, understanding and promoting best practice in the teaching of law. The work of the Centre has a particular emphasis upon the changing nature of professional legal education and training in the context of an internationalised, transformed and technology-enhanced legal services sector.

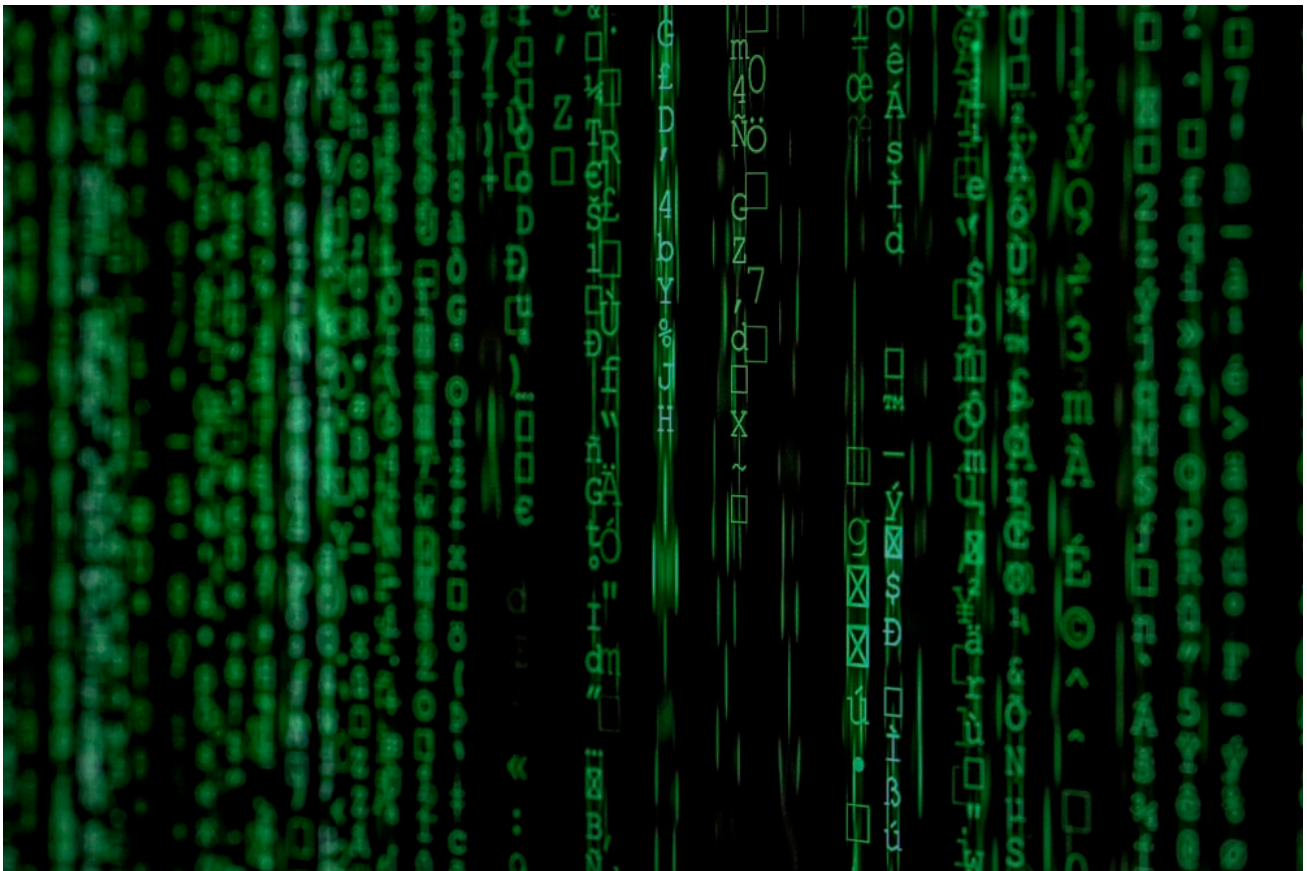
DISCLAIMER

While the Centre for Professional Legal Education (‘the Centre’) and the Author have made every effort to ensure the accuracy of information presented in this publication, they do not guarantee the accuracy or completeness of that information. The information is provided as general information only and any use of or reliance on it should only be undertaken on a strictly voluntary basis after an independent review by a qualified legal practitioner (or other expert). The Centre and the Author are not responsible for, and disclaim all liability for, any loss or damage arising out of the use of or reliance on this publication.

LICENCE

The Centre for Professional Legal Education (‘the Centre’) grants parties utilising this Report a non-exclusive, royalty-free, worldwide, non-transferable licence to use, reproduce, adapt and exploit the content of the Report for education and research purposes. In return, the Centre requires that parties utilising the Report provide an acknowledgment of the Centre and of the authors of the Report in any use of the content of the Report.

ABOUT THE PROJECT



This Report was commissioned by the Bond University Centre for Professional Legal Education as part of the research project ‘The Impact of Emergent Technologies Upon the Teaching of Core Law Units in the Australian Law Curriculum’.

The structure of the accredited Australian law degree – both the Bachelor of Law (LLB) and the Juris Doctor (JD) – continues to be determined primarily by the need to demonstrate coverage of the ‘Priestley 11’ (P11) prescribed areas of knowledge: administrative law, civil dispute resolution, company law, constitutional law, contract law, criminal law and procedure, equity, evidence, professional conduct, property law and tort law. The P11 areas of knowledge are taught via a series of core law units within the law degree, the content of which is relatively consistent across Australian law schools.

Meanwhile, the practice of law is undergoing rapid change, largely because of the emergence of disruptive digital technologies. There is a clear need for law schools to adjust the way law is taught to ensure law graduates continue to be effectively prepared for contemporary

legal practice. Many of the recent reports regarding the future of legal education and of the legal profession call for an increased emphasis in the law curriculum upon teaching digital skills and knowledge of emergent technologies, equipping work-ready graduates for technology-enhanced or technology-centric practice, while at the same time emphasising the need to retain the existing emphasis upon more traditional legal knowledge and skills.

The challenge confronting Australian law schools is the fact that many of the legal academics responsible for teaching the core law units lack the time, resources and expertise to identify and evaluate the impact of emergent technologies upon the law curriculum. The objective of this Project is to assist Australian law schools to address this challenge.

The Project is investigating the impact of emergent technologies upon the teaching of the core law units in the Australian law curriculum. The Project Leadership

Team has settled the overall research questions and method and identified six categories of emergent technologies (CETs).

CET	DESCRIPTION	EXAMPLES
Experiential technologies	New ways of experiencing the world around us	Virtual reality, augmented reality, mixed reality, digital twins
Body technologies	New ways of using our bodies	Wearables and implantables, genome editing
Information technologies	New ways of thinking, communicating, processing and storing information	Artificial intelligence, advanced machine learning, digital technology platforms, mesh app and service architecture, conversational systems, adaptive security architecture, inevitable architecture, big data, cloud computing, quantum computing, biometrics and digital id
Creative technologies	New ways of creating and making	3D printing, additive manufacturing, robots
Connection technologies	New ways of connecting	The internet of things, smart cities, intelligent things, intelligent apps, automated vehicles, bots/robots
Transaction technologies	New ways of transacting	Blockchains and distributed ledgers, cryptocurrencies, smart contracts, 'everything as a service'

Legal scholars from a variety of Australian law schools have been invited to identify the impact of each category of emergent technology upon each P11 area of knowledge, and to prepare a Report identifying the

impact of particular emergent technologies upon a particular P11 area of knowledge and any consequent changes to the way the P11 area of knowledge should be taught.

The focus of this Report is upon the impact of experiential technologies upon the teaching of evidence law.

PROJECT LEADERSHIP TEAM

The current Project Leadership team is:

Professor Nick James	Bond University	njames@bond.edu.au
Associate Professor Francina Cantatore	Bond University	fcantato@bond.edu.au
Associate Professor Wendy Bonython	Bond University	wbonytho@bond.edu.au
Assistant Professor Kylie Fletcher	Bond University	kfletche@bond.edu.au

The following former Leadership Team members made important contributions to the Project:

Associate Professor Tania Leiman	Flinders University
Associate Professor Kate Galloway	Griffith University
Associate Professor Bobette Wolski	Bond University
Associate Professor Jodie O'Leary	Bond University

WHAT ARE EXPERIENTIAL TECHNOLOGIES?

[A description of the relevant category of emergent technologies.]

Virtual reality (VR) aims to achieve total immersion of the user in the virtual (imaginary) world, physically and emotionally. Augmented reality (AR) does not replace the real world, but adds to it by combining real and virtual reality, overlaying computer generated content, like 3D artificial objects, onto the user's real world vision. Like AR, mixed reality (MR) augments the real world, adding virtual objects designed to look as though belong in that environment. AR and MR are along the spectrum between our everyday physical reality and a VR environment. Digital twin (DT) technology enables virtual creation of equipment for testing and construction before or alongside physical manufacture, potentially with the virtual and physical objects being connected by sensors, to facilitate recording of

information learned in the physical build to the virtual model and *vice versa*.

VR, AR and MR may enable the court to take a virtual tour of an accident or crime scene, guided by parties or witnesses. Adding DT, the technology may enable testing of theories of causes of accidents or injuries: with real-life measurements from the scene of an incident, 2D and 3D images can be generated to allow virtual recreation of the accident or crime scene, with simulations to model bullet trajectory, blood spatter pattern or vehicle crash analysis. This may aid expert witnesses in presenting evidence, testing hypotheses, and interpreting and explaining evidence to the court.

LITERATURE REVIEW

[A summary of current and likely future impact of the technologies upon the law in the P11 area of knowledge, and the way law in the area is administered, enforced and practised, according to recent scholarship and media commentary.]

Will these new developments change the way in which evidence is presented?

Evidence of an accident or crime scene can be generated in VR or AR from video and/or photographic evidence taken at the time of the incident. If the VR or AR technology can be demonstrated to reliably recreate the scene in the courtroom, visits to the physical scene may not be necessary, or even favoured, due to the challenges of possible changes at the scene over time as a result of the growth of vegetation, road development, building renovations or other changes. VR and AR technology may mean it is not necessary to build models, or that models can be created more accurately using DT technology, with integration between the physical model and software for more accurate testing of theories or understanding of evidence.

Does information obtained through sensory technology such as VR and AR have to comply with all the standard rules of evidence or should new laws be created?

A document as defined in the Dictionary to the Uniform Evidence Law (UEL) as 'any record of information, and

includes: ... (c) anything from which sounds, images or writings can be reproduced with or without the aid of anything else'. VR, AR, MR and DT technology recreates images with the aid of technology, to replicate a physical environment or object with which a person can interact via that technology, in an immersive way (VR) or in addition to the real world (AR, MR, DT). The 'document' is the VR/ AR/ MR or DT recreation, created using the requisite software and hardware.

The courts will need to grapple with issues such as whether the VR / AR / MR or DT evidence:

- will assist the court in resolving issues of fact or understanding the evidence;
- will properly and accurately reproduce the scene of the incident and is reliable (given recent calls for law reform following studies suggesting forensic science evidence is often unreliable);
- has the potential to be given undue weight, particularly while the use of the technology is emerging, or will be unfairly prejudicial, misleading or confusing or cause or result in undue waste of time; or
- requires directions to be given to a jury to avoid improper lines of reasoning in light of limitations,

such as the fact that the technology does not capture the full sensory experience, i.e. it does not include smell, taste, touch, or hearing.

Can an immersive VR experience be used as a memory aid by witnesses unable to recall events?

VR, AR, or MR technology could be used to revive memory in court (s 32 UEL) or out of court (s 34 UEL). Section 32 is capable of addressing the use of immersive technology to revive memory generally. Use as a memory aid would require the VR / AR / MR recording to be shown to the witness at or soon after the relevant

events and be identified by them as being an accurate reflection of their observations at the time. This could potentially be done by police officers, and attested to in their written report for the purpose of s 33 UEL. The potential danger is that the AR/VR/MR environment itself may be the basis for memory formation of the witness, separate to the original event, as the user's experience of the VR/ AR/ MR/ environment may itself form the basis for observations and inferences separate from their original perceptions of the event or matter in question in the proceedings.



PRACTITIONER PERSPECTIVES

[A summary of the views of various law teachers and legal practitioners regarding the current and likely future impact of the technologies upon the law in the P11 area of knowledge, and the way law in the area is administered, enforced and practised.]¹

¹ *Aspects of practitioner perspectives have been integrated into other sections of this report. Interviewees included a member of the New South Wales judiciary, a member of the Victorian Bar and three academics, who were interviewed in July and August 2019.*

Practitioners agreed that VR/ AR/ MR/ DT technology is documentary evidence. The primary issues relate to its admissibility.

Hearsay

VR/ AR/ MR/ DT technology may be hearsay if it includes previous representations made by a person. As with photographs or audio/video recordings, it is likely to be tendered through a party involved in the making of the evidence, though, as a document, can be tendered in its own right pursuant to s 48(1) which allows a party to 'adduce evidence of the contents of a document in question by tendering the document in question' or ('d) if the document in question is an article or thing on or in which information is stored in such a way that it cannot be used by the court unless a device is used to retrieve, produce or collate it-tendering a document that was or purports to have been produced by use of the device'.

If the VR/ AR/ MR recreation is based on photographic and/or video recordings of the original accident or crime scene made during a police investigation, this could be equivalent to photographic or video evidence, with a 3D image as opposed to 2D. If 'tag' images (AR) are added to record details of evidence found at the scene, the tags/labels may constitute hearsay but would be admissible pursuant to ss 69 and 70 UEL, which provide exceptions to the hearsay rule to allow evidence of previous representations made in the form of business records (s 69) and tags and labels (s 70) identifying such things as nature, identity, origin or ownership.

A VR recreation of a building prepared from objective evidence, such as original building and planning records, would allow for a virtual tour of the building in an historical sexual abuse case, allowing the evidence to be more readily understood, without raising hearsay issues. VR/ AR/ MR may be used to add furniture based on previous representations made by a person, but this would be little different to a sketch of a room prepared during investigations and the hearsay issue could be avoided if the testimony on which the recreation is based is given in court. The VR/ AR/ MR environment, based primarily on objective evidence, is likely to be better evidence than a hand-drawn sketch, which may not be to scale and the quality of which is dependent on the witness' drawing skills.

Opinion

Expert opinion on how VR/ AR/ MR/ DT technology works will be required in early cases, to demonstrate it can be accepted as accurately recreating (VR) or representing (AR/ MR/ DT) the area/object with overlaying of additional content. Expert evidence on the risk of juries giving inappropriate weight to the evidence due to the immersive experience may be required and is relevant to the discretions.

Experts may use VR/ AR /MR /DT technology as an aid to presenting evidence, similar to more traditional aids such as flip charts, models, and PowerPoints). A crash scene analyst may use VR to show different scenarios on how an accident occurred, based on the witness' accounts and physical evidence. A DT representation of a stairway where an accident or crime occurred could be utilised to test theories about how a victim was injured.

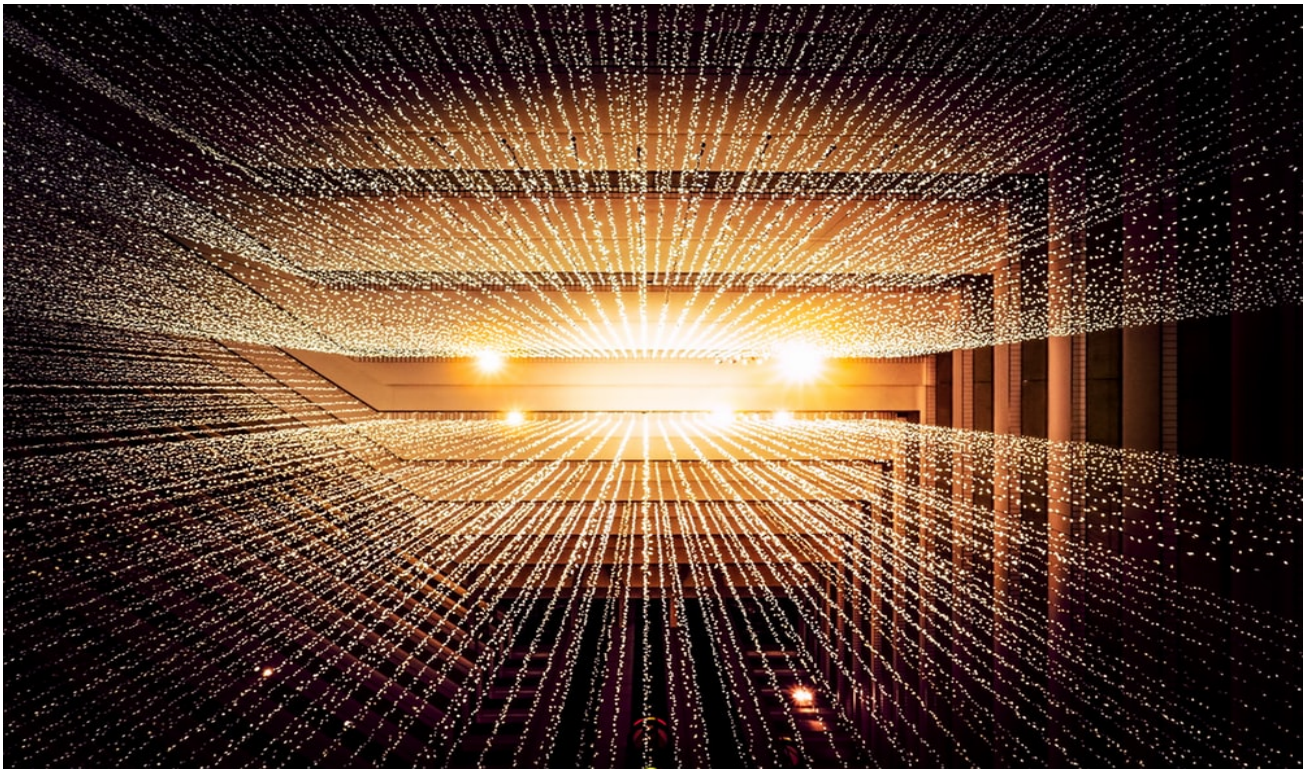
Discretionary and mandatory exclusions

Sections 135-137 of the UEL set rules for the exclusion (or limiting) of evidence based on balancing tests between the probative value of the evidence and the danger the evidence might:

- be unfairly prejudicial;
- be misleading or confusing; or
- cause or result in undue waste of time.

These dangers may apply to VR/ AR /MR /DT technology:

- The immersive nature of the technology may lead to inappropriate weight being given to the evidence, particularly if there is emotional involvement in seeing a recreation of an event from a particular perspective.
- The technology may mislead or confuse if not properly constructed, and grounded in appropriate preparation for the court such as testimony from the person who took 3D photographic evidence of the scene of a crime used to create the VR/ AR/ MR/ DT evidence or from experts involved in augmenting AR or MR evidence for the purpose of carrying out scientific tests.
- If improperly used, it may result in undue waste of time. This needs to be balanced against the potential for such evidence to be used to save the court time.



CONSEQUENCES 1

[An explanation of how this will change what current and future lawyers need to know and be able to do.]

Current and future lawyers will need to assess access to justice issues or disparity in resources posed by the use of VR/ AR/ MR/ DT technology, particularly for a criminal accused, and noting the additional ethical obligations on the prosecution.

They will need to recognise cases where VR/ AR/ MR/ DT may make evidence easier to understand, eg. a VR recreation of a building from objective evidence compared with viewing architectural plans and hearing witness' descriptions. They will need to assess the need for pre-trial agreement between the parties on the use of AR/ VR/ MR/ DT at trial. This raises the potential for use of a joint expert to assist in the trial, rather than each side engaging their own expert.

Practitioners will need to understand how AR/ VR/ MR/ DT technologies work, and the limitations of the technology, and be able to adduce relevant expert evidence of this if required. They will need to identify

where VR/ AR/ MR/ DT may enable the accuracy of a witness' evidence to be tested.

Lawyers will need to assess the risks of an immersive experience influencing the jury, and determine how this may affect the operation of discretionary or mandatory exclusions. There may be an ethical issue relating to the potential to cause harm to jury members if they are exposed to graphic representations by a VR/ AR/ MR view, so practitioners will have to identify the emotionality involved in jurors being put in the position of the plaintiff/ victim, defendant, witness or police officer (ie. the perspective from which an AR/ VR recreation is viewed may have an impact on perception). They need to consider whether there is value (or danger) in the fact finder being put in the position of a party or victim, and whether to focus the VR/ AR experiences on the perspective of a neutral bystander.

CONSEQUENCES 2

[An explanation of how this will change the way the core law unit should be taught to law students, including the scope of the unit, the learning outcomes for the unit, the learning activities undertaken by the students, and how students within the unit should be assessed.]

AR/ VR/ MR/ DT technology should not require significant changes in the way *Evidence* is taught. Evidence law has adapted to previous technological changes, including photographic, audio and video recording technology.

The primary areas of impact for the teaching of Evidence, taking into account the Priestley requirements for admission, are:

- presenting, and challenging, documentary evidence;
- rules about excluding evidence, and exceptions to those rules;
- judicial discretions to limit or exclude evidence; and
- processes to deal with potentially unreliable evidence, including notice requirements, pre-trial proceeding, judicial warnings, comments and directions.

Law students need to be agile in identifying and responding to new technologies that may assist courts to better understand the evidence before them. The emphasis should be on presentation of the best available evidence having regard to any limitations of the evidence, including issues of credibility and reliability. Reliability of forensic science evidence is currently under scrutiny, with calls for law reform by Justice Chris Maxwell, President of the Victorian Court of Appeal to guard against the risk of wrongful conviction based on unreliable forensic scientific evidence.

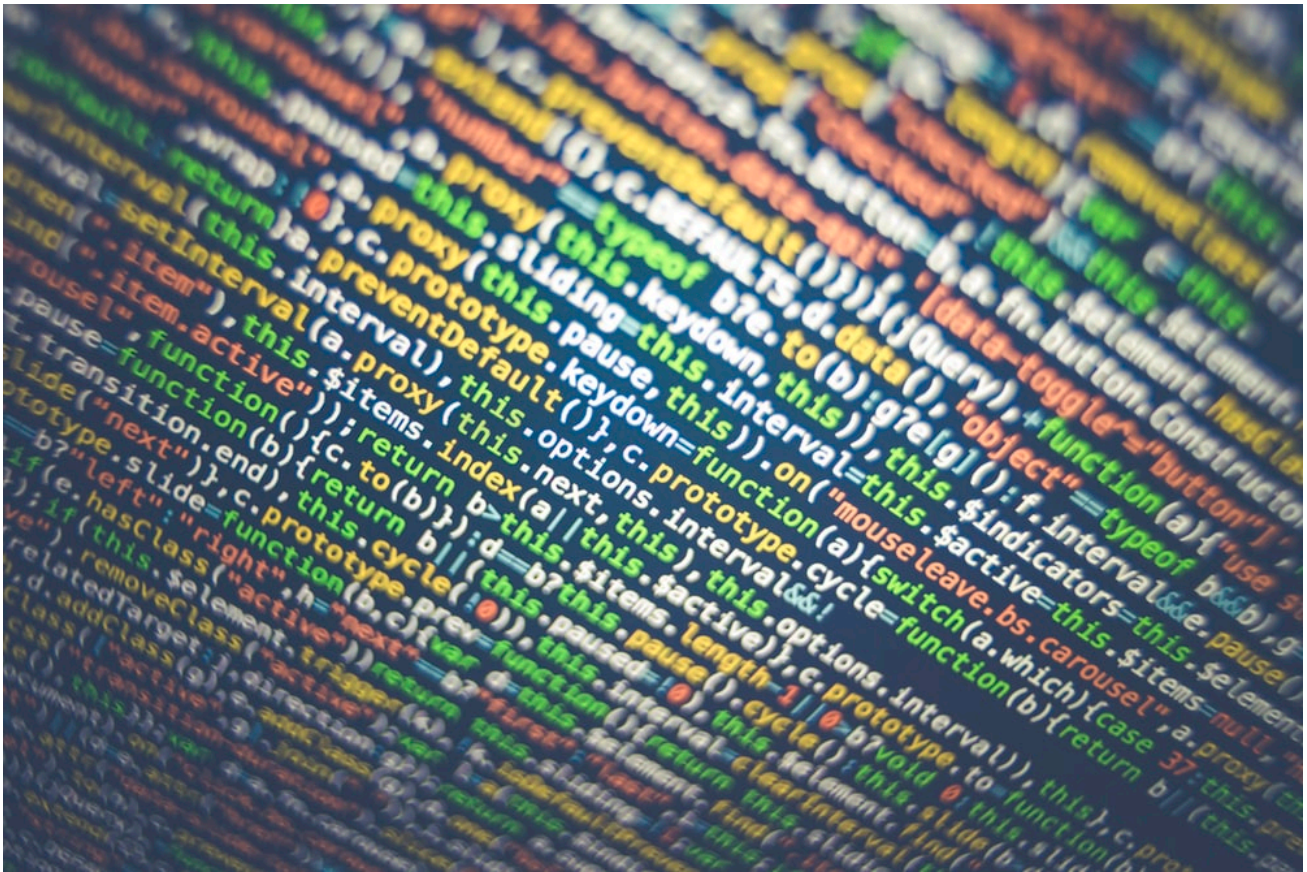
For take up of the technologies to occur, AR/ VR/ MR/ DT technologies need to be proven to be of assistance to the court in resolving the issues. They must be reliable and sufficiently accurate for the purpose for which they are being used. Strict training in their use by investigators will be required to ensure that the original accident or crime scene is properly and accurately recorded and that its authenticity can be reliably

established. As with audio or video recording, tampering must be prevented to minimise issues of credibility and reliability. The overlaying of digital content in AR/MR needs to be done appropriately in the context of the case, and ideally with agreement between the parties (potentially via a joint expert in the technology). Law students need to know how to establish or raise doubts about the credibility of evidence presented in this form with reference to these points.

Law students must be able to identify when AR/ VR/ MR/ DT evidence may fall within an exclusionary rule (such as hearsay or opinion) and how to analyse the application of such rules and exceptions to them. This can be done by incorporating hypothetical examples (pending development in the case law) of AR/ VR/ MR/ DT evidence when examining the admissibility rules most likely to apply to such evidence.

Law students need to understand the possibility of greater emotionality in reasoning by jurors as a result of an immersive experience like AR/ VR/ MR. They should also be able to identify how such risks can be appropriately minimised, including the scope for directions to the jury to avoid any unfair prejudice or scope for the evidence to mislead or confuse.

Students should also understand the need for appropriate processes pre-trial and during trial to minimise disputes about AR/VR/MR/DT evidence, including providing notice to the other side; seeking agreement where possible on the AR/ VR/ MR/ DT evidence to be presented; and being mindful of establishing an appropriate foundation for the evidence, including its limitations, so as to minimise risks the evidence may be considered to be unreliable or to trigger exclusionary (or limiting) rules under UEL ss 135-137.



BIBLIOGRAPHY AND RECOMMENDED RESOURCES

[A list of resources referred to in the Report plus additional resources.]

Articles/Books/Reports

AVRSpot, Mixed and Augmented Reality Technology In Policing: Science Fiction or Reality? (AVRSpot, 27 June 2018) <
<https://www.avrspot.com/augmented-reality-technology-policing-science-fiction-reality/>>

Carlton, Bobby, 'How AR is Making its Way into Crime Scene Investigations' *VR Scout* (31 October 2017) <
<https://vrscout.com/news/ar-crime-scene-investigations/>>

Chowdhury, Mehzeb, 'Virtual reality robots could help teleport juries to crime scenes', *The Conversation*, 26 August 2016 <
<http://theconversation.com/virtual-reality-robots-could-help-teleport-juries-to-crime-scenes-64382>>

Dentons, *Virtual Legality: Virtual Reality and Augmented Reality – Legal Issues* (Dentons, 2017) <
<https://www.dentons.com/en/insights/articles/2017/february/20/virtual-legality>>

Keane, Philip, *FARO releases VR Public Safety Software with Added Blood Spatter* (March 2018) <
<https://www.engineering.com/DesignSoftware/DesignSoftwareArticles/ArticleID/16581/FARO-releases-VR-Public-Safety-Software-with-Added-Blood-Spatter.aspx>>

Kirby, Michael --- "Where Does Truth Lie? The Challenges And Imperatives Of Fact-Finding In Trial, Appellate, Civil And Criminal Courts And International Commissions Of Inquiry" (2018) 41(2) *UNSW Law Journal* 293

Lat, David, '4 trends Shaping the Future of the Legal Profession' *Above the Law*, 5 October 2017 <
<https://abovethelaw.com/2017/10/4-trends-shaping-the-future-of-the-legal-profession/>>

Lemley, Mark A, and Volokh, Eugene, 'Law, Virtual Reality, and Augmented Reality' (2018) 166 University of Pennsylvania Law Review 1051

Tim Perdue, 'Applications of Augmented Reality' at Lifewire (2019) <<https://www.lifewire.com/applications-of-augmented-reality-2495561>>

Pool, Rebecca, 'Virtual and Augmented Reality Tech Joins the Fight against Crime' *SPIE*, 11 Jan 2019, <<https://spie.org/news/spie-professional-magazine/2019-january/ar/vr-tech-joins-the-fight-against-crime?SSO=1>>

Wilbur, Tim, 'Virtual Reality is coming to a courtroom near you' *Canadian Lawyer* 9 March 2018 <<https://www.canadianlawyermag.com/news/general/v>

[irtual-reality-is-coming-to-a-courtroom-near-you/274985](https://www.canadianlawyermag.com/news/general/virtual-reality-is-coming-to-a-courtroom-near-you/274985)>

On potential unreliability of forensic science evidence and the need for law reform, see:

Mannix, Liam, 'Top judge worried forensic evidence putting innocent people behind bars' *Sydney Morning Herald* 1 September 2019 <<https://www.smh.com.au/national/top-judge-worried-forensic-evidence-putting-innocent-people-behind-bars-20190823-p52k3l.html>>

Urban, Andrew L., 'Forensic evidence under the microscope – looks sick' *The Wrongful Convictions Report*, 18 October 2019 <<https://wrongfulconvictionsreport.org/2019/10/18/forensic-evidence-under-the-microscope-looks-sick/>>