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# Rachael Medhurst, Senior Lecturer In Digital Forensics, University Of South Wales

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*Rachael Medhurst MSc, BSc (Hons), FHEA, MCSFS, MCFE is Course Leader of MSc Applied Cyber Security, Senior Lecturer in Digital Forensics, and PhD student in Emerging Technology and Digital Forensics.*

**FF: Please tell us a bit about your background working with the police and how you ended up**

## as a Senior Lecturer in Digital Forensics at the University of South Wales.

After completing my BSc (Hons) and MSc within Digital Forensics at the University of South Wales, I became a Digital Forensic Investigator within the private sector. While working within the private sector of Digital Forensics, I worked on a range of high-end cases for police forces throughout the UK that resulted in attending court as an Expert Witness. With these skills, knowledge, and passion for continual development, this led to me becoming a Lecturer within Digital Forensics at the University of South Wales, while completing a Postgraduate Certificate in Learning and Teaching in Higher Education (PGCLTHE). After achieving my PGCLTHE and gathering active experience as a Lecturer, this has since led to my appointment as Senior Lecturer in Digital Forensics. As well as becoming a Senior Lecturer, I am also the Course Leader of the MSc Applied Cyber Security while conducting research into the Digital Forensics field. This research has since led to starting a PhD within the Digital Forensics sector.

### **FF: What digital forensics courses and research opportunities does your department offer? What can students expect to learn?**

At the University of South Wales students are provided with authentic learning experiences that can be implemented within the cyber industry upon graduation. This is being achieved by emulating a “workplace learning environment”. As such, it differs from traditional lecture driven learning. The use of the workplace learning environments provides students with cutting edge facilities to enable practical and real-world experience. This includes the Crime Scene House, Moot Court Room, Cyber Labs, Hydra Suite, and Secure Operations Centre (SOC) which are used for scenario-based case work.

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Additional opportunities are available to students, including Digital Forensic software certifications, Bond Solon training for Expert Report Writing and Court Room Skills, while also organising industry seminars with industry including Gwent Police, Tarian Regional Cyber Crime

Unit (RCCU), Dyfed Powys Police, South Wales Police, Bridewell Incident Response Investigations, Perseus Intelligence Ltd, etc.

We offer a range of courses that relate to the Cyber industry and include Digital Forensics, including BSc (Hons) Digital Forensics, BSc (Hons) Applied Cyber Security, MSc Applied Cyber Security and MSc Digital Forensics. The University of South Wales has been named Cyber University of the Year for four consecutive years at the National Cyber Awards, and we are one of only eight Universities in the UK to be awarded Gold by the National Cyber Security Centre as an Academic Centre of Excellence.

**FF: What are your own teaching and/or research interests?**

While being a Senior Lecturer in Digital Forensics, my main teaching responsibilities at both Undergraduate and Postgraduate include Digital Crime Scene Management, Digital Forensic Techniques, Advanced Digital Forensic Techniques, Mobile Device Forensics, and Incident Response Investigations. To ensure that teaching material is relevant and up to date and ensure the ability to share knowledge with industry and society, research is vital. The main research areas that I have been involved in, include:

- ITV News – Rise in Domestic Abuse Crimes using Home Technology
- *The Conversation* – Six Parts of your Car that Gather Data on You
- *Daily Telegraph* – Is your Smart Car Spying on You?
- Higher Education and Further Education Conference – Vehicle Forensics.
- *The Conversation* – The ‘internet of vehicles’ could help make roads safer – but it may also help thieves break into your car.

Later this year, I will be presenting at the Chartered Society of Forensic Science (CSFS) Conference on the 27th of October 2023. This conference will be discussing the way in which authentic, workplace emulation learning is being achieved within Digital Forensics at the University of South Wales. While research is vital, Continual Professional Development is equally as important. Therefore, I ensure to complete continuous training courses on aspects including: Vehicle Forensics, Windows 11 Forensics, Apple Mac Examinations, Incident Response Investigations, etc.

**FF: You recently appeared on BBC Frontline Fightback. Tell us about your experience and how it came about.**

After writing an article for *The Conversation* in January 2023 about the ways in which a vehicle is collecting data about the driver and their actions. This then fed into research on Vehicle Forensics and how this can be used to support criminal case work. After this release, BBC reached out to

discuss the research and if I would be interested in participating in an interview for the documentary series of Frontline Fightback. The interview was recorded within the following weeks and was a great opportunity to share information surrounding Digital Forensics and how this is being used to support criminal cases. This interview and series gathered great feedback into the Digital Forensic sector and the University of South Wales.

**FF: What digital forensics reading material or resources do you recommend to supplement academic learning?**

The content that is delivered on the course is validated with industry input to present consistency with industry and the delivery of cyber ready graduates. While the content is a necessity, the use of the cutting-edge facilities within the university is imperative, such as the Crime Scene House, Moot Court, Secure Operations Centre (SOC), etc. to replicate a work environment effectively. This is also achieved through industry engagement throughout teaching and assessment. However, while contact hours with the module leaders are vital in the student's development, it is also imperative that students are autonomous learners by conducting independent study, certifications and attending networking events. This can be helped by the incorporation of Industry Seminars at University of South Wales by our Cyber related industry partners on a fortnightly basis for all cyber students, conducting directed study through resources such as webinars, seminars, reading material provided by industry, including Magnet AXIOM, Cellebrite, Forensic Focus, Passware, SudoCyber platform, and additional certifications on offer such as Bond Solon and Magnet Certified Forensic Examiner (MCFE).

**FF: Which areas of digital forensics currently offer the most exciting career opportunities, in your opinion?**

With the developments in technology which brings great advantages to our everyday lives, there is also the disadvantage of an increase of cyber threats and cyber-enabled crimes that can have huge detrimental impacts on organisations, governments, and individuals. Therefore, the need for Digital Forensic specialists is an ever-increasing demand of skillset. The career opportunities available to individuals that obtain these skills include: Digital Forensics Investigators within Law Enforcement, Incident Response Specialists (where individuals use their Digital Forensics skills to uncover the key evidence and artefacts relating to a cyber-attack), E-Discovery Analysts (who handle the documentation that is in use for legal proceedings), as well as other opportunities such as quality assurance, banking firms investigating fraud, research, and development, etc. Throughout my career, there has been more of a focus on law enforcement, however there are a range of career opportunities available to meet everyone's desires in their career development within Digital Forensics.

**FF: You're now doing a PhD in Emerging Technology and Digital Forensics. Tell us about your research and what made you choose this topic as a basis for your studies.**

After the industry, teaching, and research experience, I have now started a PhD (Doctorate of Philosophy) at the University of South Wales surrounding the topic area of Emerging Technology and Digital Forensics. The topic of Emerging Technology and Digital Forensics was proposed because traditionally Digital Forensics incorporates the identification, acquisition, and analysis of data, which is stored on data sources such as hard drives, mobile devices, etc. However, with the new and emerging technologies created to assist in our daily lives, such as medical devices, gym equipment, and transport, that is being connected to a network, this could lead to further cyber threats and the requirement of developed digital forensic methodologies to handle such case work and support criminal and corporate proceedings.

This PhD research aim is to identify the emerging technology, the current digital forensic processes, then review the nature of the attack vectors on these devices, gather evidence, attribute responsibility, and support legal proceedings to ensure prosecution of criminal offences are achieved. From the developed understanding of the digital forensic processes on emerged technologies, a digital forensic procedure and incorporation to a forensic methodology will be created to allow the implementation and support for stakeholders including digital forensic investigators, medical professionals, cybersecurity specialists and law enforcement agencies.

### **FF: What do you enjoy outside of digital forensics?**

While Digital Forensics is a core focus, outside of work and continual professional development, I am a keen traveller exploring different countries and participating in various thrill-seeking activities.

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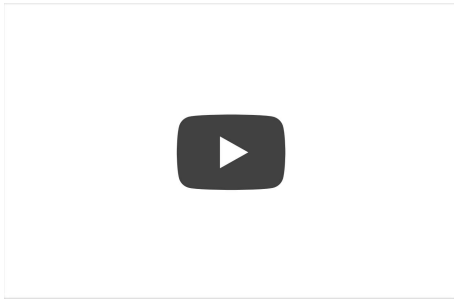
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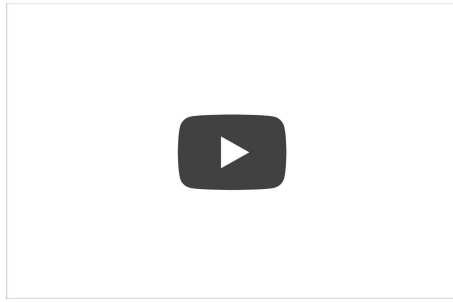


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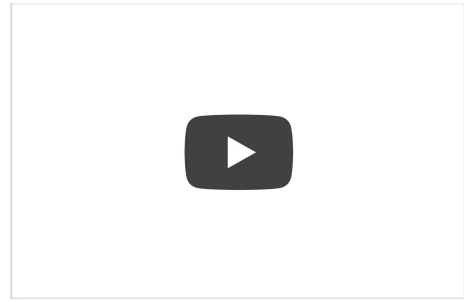
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