

New Forensic Techniques

Appendix 3

The following scientific techniques were developed recently and are still worked on. They are promising forensic applications and they were presented between 2014 and 2020 within the context of: Lecture Series Frontiers of Forensic Science, at the University of Amsterdam (UvA) *

First Symposium of the Van Ledde Hulsebos Center [CLHC], 24 October 2014:

- 1) Impact of the velocity of blood droplets for crime scene reconstruction, UvA, Nick Laan.
- 2) Monitoring the presence of biodiversity and ecodynamics type V inhibitors in sewage water (UvA) and Watercycle Research Institute, Ana Causanilles Llanes.
- 3) Building Bayesian Networks for legal evidence with narratives, RUG, Charlotte Vlek.
- 4) Towards interactive, intelligent and integrated multimedia analytics, Jan Zahalka, RUG.
- 5) Forensic science in the Netherlands: Past, present and future, HvA, WODC, Police Academy, Christianne de Poot.

Forensic Molecules in Tissues, Fnger marks, and Hairs, 13 February 2015.

- 6) Criminal Chemical Profiling through MALDI MSI of latent finger marks, Simona Francese, Biomedical Research Centre, Sheffield Hallam University, Great Britain.
- 7 The possibilities of forensic hair imaging, Eva Cuypers, Toxicology and Pharmacology Laboratory, University of Louvain, Belgium.
- 8) Conversion of human tissue to digital maps: forensic opportunities, Garry Corthals, van 't Hoff Institute for Molecular Sciences, UvA.

Forensic Anthropology, 3 maart 2015

- 9) Forensic anthropology, A South African Perspective, The Human Skeleton in Forensic Medicine, Maryna Steyn, University of Pretoria, South Africa.

Forensic Biometrics, 11 maart 2016:

- 10) Forensic biometrics: Introduction – Applications-Validation, Didier Meuwly, Universiteit Twente [UvT] / NFI,
- 11) A new approach to calculate the likelihood ratio of a fingerprint comparison, AFIS, Jeannette Leegwater, UvA/UT/NFI,
- 12) Face Value: the search for evidence in forensic quality facial images, FISWG, Deepface: Closing the Gap to Human-Level Performance in Face Verification, Chris Zeinstra, UT.

Criminal Law, Criminalistics and Forensic Statistics, 10 juni 2016:

- 13) Marjan Sjerps, NFI b) Charles Berger, NFI c) Jacob de Zoete, UvA d) Miranda de Meijer, Public Prosecution, UvA.

Epigenetic signatures; Forensic DNA-testing at the next level, d.d. 23 september 2016:

- 14) Developing new methods for forensic investigation using Epigenetics, Bruce McCord, Florida International University, Miami, USA,
- 15) The body calendar: Chronological age determination using DNA methylation

markers, SILS (UvA),

- 16) Studying the causes of individual differences in DNA methylation levels using data from twins, Jenny van Dongen, Dept of Biological Psychology, VU.

3rd CLHC Forensic PhD Symposium: The value of interdisciplinary collaboration in forensic science, d.d. 28 oktober 2016:

- 17) Reconstructing Crime with Trace information, Madeleine de Gruyter,
- 18) Fingermarks, beyond the source, Elmarije van Straalen, Anouk de Ronde, Ward van Helmond; HvA, NFI, Politie Academie,
- 19) The precision of virtual pelvises derived from ClinicalCT-images and its application in forensic anthropology, Kerrie Colman, AMC,
- 20) Subaerial cadaver decomposition of juvenile remains; new insights and serious implications for Casework, Tristan Krap, AMC,
- 21) The diagnostic value of Post-Mortem Computed Tomography (PMCT) and Post-Mortem Magnetic Resonance imaging (PMMR) in forensic autopsies, Rob van Kan, Dutch Police, Maastricht University,
- 22) Green Forensics – Isotopic traceability in horticulture. Eva de Rijke, SILS, UvA,
- 23) Flaking Paints – A multidisciplinary approach in the study of zinc soap degraded paintings, Katrien Keune, Rijksmuseum.

Explosives! d.d. 25 november 2016:

- 24) Pyrotechnics in The Netherlands, Rikus Voortmeijer / Mattijs Koeberg, NFI,
- 25) Introducing the FEXIN project: IRMS and GC-IRMS analysis of TATP, Karlijn Bezemer, NFI/HIMS-UvA,
- 26) Overview of Explosives and Fireworks Research at TNO, Antoine van der Heijden, TNO/TU Delft.

Challenges and Opportunities in Forensic Data Science, d.d. 3 maart 2017:

- 27) Detecting and disrupting Criminal Networks, Paul Duijn, FIOD / UvA,
- 28) Cyber Investigations – Investigating a cyber-security incident, Hans Wim Tinholt, KPMG,
- 29) Forensic Big Data platforms from a European perspective, Zeno Geradts, NFI/UvA.

Forensic archeological and human taphonomy expertise in The Netherlands, d.d. 22 september 2017:

- 30) The making of a human taphonomy facility in Amsterdam, Roelof-Jan Oostra, AMC / UvA,
- 31) Forensic archeology and taphonomy: two sides of the same coin, Mike Groen, NFI / UvL,
- 32) Finding buried human remains with geophysics, Mark Löschen, Dutch Police,
- 33) Taphonomy of juvenile remains, Tristan Krap, AMC / UvA.

4th CLHC Symposium, d.d. 27 oktober 2017:

- 34) Isotope analysis as a human provenance tool, Esther Plomp, VU – Earth Sciences,
- 35) Multi-component profiling of fireworks, Karlijn Bezemer, UvA / NFI,
- 36) Opportunities and challenges of forensic DNA-analysis on-chip, Brigitte Bruijns, University of Twente,
- 37) Non-contact age estimation of semen traces using fluorescence spectroscopy, Nihad Achetib, AMC,

- 38) Combining a screening checklist with a physical examination for detecting child abuse and neglect in the Emergency Department led to the detection of more child abuse cases - an accurate study, Rian Teeuw, AMC,
- 39) Examples of sad but intriguing forensic explosives investigations, Jan Dalmolen, NFI,
- 40) The key role of technology in the criminal justice system, Mark Wiebes, Dutch Police.

Forensic Frontiers, d.d. 24 november 2017:

- 41) User interfaces in Sort it Out, Paul van den Corput, TU Eindhoven,
- 42) Jungle computing big data, Jason Maassen, E-Science Center,
- 43) All-in Police Lab, Arthur van Bunningen, Dutch Police,
- 44) Big data LR's, Cor Veenman, NFI / Leiden University.

Firearms, toolmarks and physical trace pattern comparison, d.d. 9 maart 2018:

- 45) Towards more objective comparison of tool and firearm marks, Martin Balkers-Soerensen, NFI,
- 46) Bullet deflection through soft tissue simulants, Erwin Mattijssen, NFI,
- 47) Forensic Radiology in shooting incidents, Paul Hofman, Maastricht UMC.

Frontiers of Forensic Science, d.d.17 mei 2018: Afscheid Ate Kloosterman, Lutherse Kerk, A'dam

Isotopes-Research in the Netherlands Cultural Heritage – a changed paradigm, d.d. 14 juli 2018.

Responsible Research and Innovation in Forensic Science, d.d. 28 september 2018.

A VU Forensics Overview, d.d. 7 juni 2019:

[an insight in the forensic science expertise that exists and is being developed at the VU, Boelelaan, Amsterdam]

- 48) Clay in fireworks: an earthly paradise for chemical profiling, Rob Haselberg, Science, Analytical Chemistry,
- 49) Evidential value of mixed DNA-traces, Klaas Slooten, Science, Mathematics,
- 50) Isotope analysis as a forensic tool for provenancing unidentified victims, Lisette Kootker, Science, Geology and Geochemistry,
- 51) The art of using forensic science, Christianne de Poot, Law.

New Frontiers in Forensics in International Criminal Justice, UvA, Amsterdam, d.d. 13 september 2019:

- 52) Digital Forensic Evidence and International Criminal Law, Francesca Zarb en Kartia Zappavigna, Faculty of Law, UvA,
- 53) Forensic Science at the ICC, Christina Ribeiro, Public Prosecutor, ICC,
- 54) Quality Management within Forensic Science from an international perspective, Michel Smithuis, NRGD.

CLHC-Symposium "Crossing Borders", Amsterdam University, d.d. 25 oktober 2019:

- 55) Biological Traces Division, NFI, Novel molecular approaches for forensic case work, DNA, Titia Sijen, NFI,
- 56) Large scale DNA-identification of missing persons, successes, challenges and future directions, Thomas Parsons, ICMP, The Hague,
- 57) Antidoping, its interface with forensics and future perspectives, Alan Brailsford, King's College, London,
- 58) Exploring the forensic application of a handheld NIR spectrometer, Yannick Weesepeel. Food Safety Research, Wageningen,
- 59) Electrochemical fingerprinting of drugs of abuse, Karolien de Wael, University of Antwerp,
- 60) Identifying cell phone users by comparing mobility factors, Wauter Bosma, Forensic Big data Analysis, NFI,
- 61) ARISTA a human taphonomic research facility. Rick van Rijn, Academic University Medical Centers, NFI,
- 62) Crossing disciplinary borders: How a financial public-private partnership can detect otherwise unnoticed crimes and follow their financial flows, Jill Coster van Voorhout, Faculty of Law.

Frontiers of Forensic Science, Building Leeuwenburg, Amsterdam University, 6 March 2020:
The Footprint of Fingermarks:

- 63) Not just a fingerprint, Robert Otte, East Netherlands Police,
- 64) Fingermarks at activity level, Anouk de Ronde,
- 65) Chemical profiling of fingerprints, Ward van Helmond, NFI,
- 66), Fingermarks in the criminal justice system, Elmarije van Straalen,
- 67) New dimensions in Forensic Fingerprint Investigation, Marcel de Puit, NFI.

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Livia Jakobs, 12th November, 2020