SOTIRIOS A. TSAFTARIS, Ph.D.
Chair in Machine Learning and Computer Vision

TRACK RECORD SUMMARY

- A proven **leader** capable on leading strategic national initiatives (e.g. the CHAI AI hub).
- **Advisor** to policy makers on matters of AI, sovereignty, AI for health, AI for scientific research.
- **Expertise** on machine learning theory and computational methods. Research focus in: representation learning, multimodal learning, causal AI, and learning with less. Application focus in the natural and life sciences with considerable effort in healthcare, biomedical research, and medical imaging.
- **PhD** 2006 from Northwestern University, USA, Dept of Electrical Engineering and Computer Science.
- **International work experience** in five countries (UK, USA, Italy, Greece, Japan).
- **Several high-profile publications** of multidisciplinary character in peer reviewed journals and conferences (highly ranked in broad sciences, AI/ML, medical image analysis and imaging, and health).
- Work **recognized** with best paper awards and nominations (e.g. *ISMRM*, *SCMR*, *STACOM*), journal covers (e.g. *IEEE Signal Processing Magazine*), prestigious fellowships (e.g. *Canon Medical/RAEng Research Chair in Healthcare AI*, *Onassis*), and media coverage (*New York Times*, *MIT Technology Review*, etc).
- Invited to present as keynote (e.g. MIUA, DART, STACOM, ICANN) or invited speaker (e.g. ICLR).
- Extensive **funding** as principal or co- investigator (£45.7m, 2013-) from EPSRC, BBSRC, NIH, and Industry.
- Considerable **industry** impact and large network of **collaborators**.
- Considerable experience in **managing** research teams and leading research vision for large institutions.
- Strong record of **service** to the academic community, including serving as editor and event organiser.
- Extensive record of **supervision** of students and research staff.

EDUCATION

PhD in Electrical and Computer Engineering   *2006*
  Dept of Electrical Engineering and Computer Science, Northwestern University, Evanston, IL, USA

MSc in Electrical and Computer Engineering   *2003*
  Dept of Electrical and Computer Engineering, Northwestern University, Evanston, IL, USA

Diploma in Electrical and Computer Engineering   *2000*
  Dept of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Greece

CURRENT EMPLOYER

Address: Usher Building, 5-7 Little France Road, Edinburgh BioQuarter - Gate 3 Edinburgh EH16 4UX, UK work email: S.Tsaftaris@ed.ac.uk   web: https://vios.science

Duties/responsibilities:
- As a leader of my research team (https://vios.science) it is my responsibility to:
  - develop a research program in AI and data science with applications in medicine, biology, and natural sciences
  - solicit funding, and recruit research staff
  - supervise and mentor team members
- As director of the CHAI AI Hub:
  - manage the delivery of the hub coordinating across all partners and stakeholders
  - strategic vision of the hub
  - engage with the funder and national entities and the government
  - contribute to the national AI agenda and landscape
- As a teaching faculty:
  - participate in various committees and exam boards
  - teach courses at the undergraduate/post-graduate level (Electrical Engineering Discipline)

EMPLOYMENT HISTORY

DSIT Fellow: AI for Science Expert Adviser, Department of Science, Innovation and Technology, UK Government   *Nov 2025 – Present*

Director, Causality in Healthcare AI Hub (CHAI) The University of Edinburgh   *Feb 2024 – Present*

Director, Sotirios Tsaftaris Ltd	*Sept 2023 – Present*
Affiliated Lead Researcher, Archimedes Research Center Greece	*Jan 2023 – Present*
Canon Medical/Royal Academy of Engineering Research Chair in Healthcare AI, The University of Edinburgh	*April 2019 – Present*
Chair in Machine Learning and Computer Vision (Full Professor)**, The University of Edinburgh**	*August 2019 – Present*
Chancellor's Fellow and Reader (US equiv. Associate Professor)**, The University of Edinburgh**	*August 2018 – July 2019*
Turing Fellow, The Alan Turing Institute	*Sept 2017 – Sept 2023*
ELLIS Fellow, European Laboratory for Learning and Intelligent Systems	*October 2021 – Present*
Chancellor's Fellow (Senior Lecturer Grade)**, The University of Edinburgh**	*September 2015 – July 2018*
Director, IMT Institute for Advanced Studies Lucca (Italy) Pattern Recognition and Image Analysis Unit (PRIAn)	*July 2012 – Oct 2016*
Assistant Professor, IMT Institute for Advanced Studies Lucca (Italy) Area of Computer Science and Applications	*September 2011 – 2015*
Adjunct Assistant Professor, Northwestern University (USA) Departments of Electrical Engineering and Computer Science and Radiology, Feinberg School of Medicine	*July 2011 – Sept 2016*
Research Assistant Professor, Northwestern University (USA) Department of Radiology, Feinberg School of Medicine	*January 2009 – July 2011*
Research Assistant Professor, Northwestern University (USA) Department of Electrical Engineering and Computer Science	*November 2006 – July 2011*
Visiting Researcher, Meiji University (Japan) Institute of Applied DNA Computing, Kanagawa-Ken	*September 2005*
Research Assistant, Northwestern University (USA) Department of Electrical Engineering and Computer Science, Image & Video Processing Laboratory	*July 2002 – July 2006*
Graduate Researcher, CERTH (Greece) Informatics & Telematics Institute, Center for Research and Technology Hellas (CERTH) Greece	*September 2000 – July 2001*

AWARDS AND HONORS

Inward Investment Award (Canon Medical & University of Edinburgh) INTERFACE	*2025*
Best paper, FAMI a MICCAI workshop	
Audience award, Medical Imaging Deep Learning	*July 2021*
Best paper, DART a MICCAI workshop	*Sept 2021*
Best regular paper award, STACOM a MICCAI workshop	*Sept 2017*
Magna Cum Laude award, top paper International Society for Magnetic Resonance in Medicine (ISMRM)	*May 2012 & 2014*
Early Career Award finalist, Society for Cardiovascular Magnetic Resonance (SCMR)	*Feb 2011 & 2019*
Distinguished Reviewer, Journal of Magnetic Resonance Imaging	*Years 2011 and 2012*
New Entrant Stipend Award, International Society for Magnetic Resonance in Medicine (ISMRM)	*February 2008*
Alexander S. Onassis Postgraduate Scholarship, Onassis Foundation	*Sept 2001 – Aug 2005*
Murphy Fellowship, Northwestern University	*Sept 2001 – Sept 2002*
Award of Excellence, Technical Chamber of Greece	*Sept 2001 – Sept 2002*

PROFESSIONAL AND ACADEMIC ACTIVITIES

Participation in Executive/Advisory Boards	*2019 – Present*

- INCISE - INtegrated TeChnologies for Improved Polyp SurveillancE (U. of Glasgow), June 2020-

- Advanced Imaging: Radiogenomics (U. of Glasgow, Living Lab), June 2022-
- Programme for High-Dimensional Translation in Neurology (UCL, KCL), Feb 2020 -
- Tommy's Centre for Maternal and Fetal Health (U. of Edinburgh, Medical School), Jan 2020-Jan 2022
- HDR UK/Turing PhD Programme Funded by the Wellcome Trust (several universities, I represented Edinburgh), Nov 2019-Aug 2020

Participation in policy and stakeholder events   *2011 – Present*
- Chief Scientist's Office meeting for a Scottish-wide bid on a network of digital pathology, imaging, and AI centres for the Industrial Strategy Challenge Fund, May 2018, Edinburgh
- AI Stakeholders meeting, Royal College of Radiologists in partnership with The Alan Turing Institute, Health Data Research UK (HDR UK) and EPSRC, May 2018, London
- NHS Health and Social Care Network, Nov 2018, Aberdeen
- European Commission, Scientific support to agriculture: competitiveness, quality and sustainability, European Commission, Joint Research Center, April 2014 Athens, Greece
- Innovate UK, UK-US Meeting on Technology exchange for phenotyping, Jan 2017, Arizona, USA

Grant Reviewer   *2009 – Present*
- National Institutes of Health (NIH, USA) Reviewed challenge grant applications for the Surgical Sciences, Biomedical Imaging and Bioengineering special emphasis panel. June/July 2009
- German Federal Ministry of Education and Research (Germany). July 2011
- Biotechnology and Biological Sciences Research Council (BBSRC, UK). Aug 2015
- Leverhulme Trust (UK). Mar 2016
- British Heart Foundation (BHF, UK). Aug 2017
- National Science Foundation (NSF, USA). Nov 2017
- Netherlands Organisation for Scientific Research (NWO). Aug 2017, Feb 2018
- European Research Council (ERC, EU). May 2018

Associate Editor   *2011 – Present*
- IEEE Transactions on Medical Imaging, since 4/2018
- IEEE Journal of Biomedical and Health Informatics, 7/2011 – 1/2021
- Digital Signal Processing (DSP), Elsevier 7/2014-4/2018

Guest Editor   *September 2014 & 2015*

Simulation and Synthesis in Medical Imaging – IEEE Transactions on Medical Imaging 2017 (with A. Frangi, Leeds; and J. Prince, John Hopkins University)

Joint Special Issue on Reproducible Research in Signal Processing - Digital Signal Processing & Software X 2016 (with O Gerek, Anadolu; B. Boashash, Queensland; M. Leszczuk, AGH; W. Armour, Oxford; and D. Wallom, Oxford)

Computer Vision and Image Analysis in Plant Phenotyping - Machine Vision and Applications 2015 (with H. Scharr, Juelich; H. Dee, Aberystwyth; A. French, Nottingham)

Conference organizing committee   *2018 – Present*

European Conference on Computer Vision (ECCV 2020), Glasgow, UK, Tutorial Chair
IEEE International Conference on Image Processing (ICIP 2018), Athens Greece, Doctoral Symposium Chair

Tutorial Organizer   *2014 – Present*

Diffusion Models for Medical Imaging – MICCAI 2023
DREAM: Disentangled Representations for Efficient Algorithms for Medical data - Medical Image Computing and Computer Assisted Interventions (MICCAI) 2020 and 2021
Data Augmentation Techniques for Deep Learning – International Conference on Acoustics, Speech, & Signal Processing (ICASSP) 2019

Workshop Organizer   *2014 – Present*

Simulation and Synthesis in Medical Imaging - MICCAI 2016 and 2017
Computer Vision Problems in Plant Phenotyping - European Conference on Computer Vision (ECCV) 2014
Computer Vision Problems in Plant Phenotyping - British Machine Vision Conference (BMVC) 2015 and 2018
Computer Vision Problems in Plant Phenotyping - International Conference Computer Vision (ICCV) 2017
Computer Vision Problems in Plant Phenotyping - IEEE Computer Vision and Pattern Recognition Conference (CVPR) 2019
Computer Vision Problems in Plant Phenotyping – European Conference on Computer Vision (ECCV) 2020
Domain Adaptation and Representation Transfer (DART) – MICCAI 2021, 2022, 2023

Conference Area Chair   *2015 – Present*

Computer Vision and Pattern Recognition (CVPR) 2021, Nashville, USA

Medical Image Computing and Computer Assisted Interventions (MICCAI) 2020, Lima, Peru
Medical Image Computing and Computer Assisted Interventions (MICCAI) 2018, Granada, Spain
IEEE International Conference on Multimedia and Expo (ICME 2018), San Diego USA
International Conference on Computer Vision (ICCV 2017), Venice, Italy
19th International Conference on Image Analysis and Processing (ICIAP 2017), Italy
IEEE Multimedia Signal Processing Workshop (MMSP 2016), Canada
IEEE International Conference on Visual Communications and Image Processing (VCIP 2015), Singapore

Technical Program Committee Member
IEEE IPTA 2012, Special Session on High Performance Computing in Computer Vision Applications, Istanbul Turkey (2012); 4th International Symposium on Information Technologies in Environmental Engineering, Thessaloniki, Greece (2009); Kellogg Nanobusiness Conference, Evanston, IL (2004); Int. Conference on Augmented, Virtual Environments and Three-Dimensional Imaging, Mykonos, Greece (2001)

Reviewer   *2011 – Present*
- IEEE Trans on Image Processing, Signal Processing, Inf Technology in Biomedicine, Circuits and Systems for Video Technology, Information Forensics & Security, Comp Biology and Bioinformatics
- Circulation; JACC; PloS Biology; Nature Scientific Reports; Journal of Magnetic Resonance Imaging; EURASIP Journal of Applied Signal Processing; Computerized Medical Imaging and Graphics
- MICCAI; IEEE Int Conf on Image Processing (ICIP), on Acoustics, Speech, and Signal Processing (ICASSP); International Conference of Digital Signal Processing
- International Conference of the International Society for Magnetic Resonance in Medicine (ISMRM)

MEMBERSHIP IN PROFESSIONAL BODIES

SCMR: Society for Cardiovascular Magnetic Resonance   *since December 2010*
ISMRM: International Society for Magnetic Resonance in Medicine   *since February 2008*
IEEE Senior Member (2018): Institute of Electrical and Electronic Engineers   *since July 2002*
Chartered Engineer in Greece (Technical Chamber of Greece)   *November 2000 – 2011*
Hellenic Association of Mechanical & Electrical Engineers   *November 2000 – 2011*

UNIVERSITY SERVICE

Member, Promotions Committee (Chair and Reader)   *June 2023 – Present*
   University of Edinburgh, School of Engineering, UK
Member, Health and Science Steering Group   *June 2024 – Present*
   University of Edinburgh, College of Science Engineering, UK
Co-Chair, AI and Robotics Review Committee   *Sept 2021 – Sept 2022*
   University of Edinburgh, School of Engineering, UK
Chair, Health and Biomedical Engineering Strategy Committee   *Sept 2021 – Sept 2022*
   University of Edinburgh, School of Engineering, UK
Board Member, MSc and Undergraduate Study Boards   *Jan 2016 – Present*
   University of Edinburgh, School of Engineering, UK
Committee Member, Research Data Service Steering Group   *June 2017 – Present*
   University of Edinburgh, School of Engineering, UK
Committee Member, Computing Committee   *September 2012 – Sept 2024*
   IMT Institute for Advanced Studies Lucca, Italy
Committee Member, Faculty and Academic Council   *January 2012 – Sept 2015*
   IMT Institute for Advanced Studies Lucca, Italy
Committee Member, Graduate Student Advisor Committee   *June 2004 – June 2006*
   McCormick School of Engineering & Applied Sciences, Northwestern University
International Liaison, Chair   *September 2004 – June 2006*
   Northwestern University Nanoalliance
Committee Member, Graduate and Curriculum Committee   *September 2003 – September 2006*
   Northwestern University, Department of Electrical Engineering and Computer Science

SUPERVISION OF STAFF AND STUDENTS

PhD supervisor (unless otherwise noted I was the first supervisor) (Italic font denotes alumni)
1. K. Guo (UoE PhD, -) Causal medical imaging [industry co-funded]
2. I. Stogiannidis (UoE PhD, -) Causal medical imaging [industry co-funded]
3. A. Cabello Cano (UoE PhD, -) Active causal AI

4. N. Spyrou (UoAthens PhD, -) Causal vision language models [3]
5. T. Melistas (UoAthens PhD, -) Causal concept learning [3]
6. Y. Yao (UoE PhD, -) Medical vision language models [2]
7. J. Yan (UoE PhD, -) Causality in healthcare
8. Y. Xue (UoE PhD, -) Machine unlearning
9. Y. Du (UoE PhD, -) Fairness in medical imaging and accelerated MRI
10. K. Vilouras, (UoE PhD, -), Invariant representations for multiple environments [industry co-funded]
11. R. Dutt (UoE PhD, -), Parameter efficient learning [2]
12. *C. Boland (UoE EngD, 2026), Learning with less [industry co-funded] (now postdoc TU Denmark)*
13. *P. Sanchez (UoE PhD, 2024), Causal machine learning [industry co-funded] (now founder of Sinkove)*
14. *X. Liu (UoE PhD, 2023), Learning to disentangle (now Huawei) [industry co-funded]*
15. *T. Xia (UoE PhD, 2022), Pseudo healthy synthesis as a latent variable (now Imperial College London)*
16. *A. Chartsias (UoE PhD, 2020), Multimodal cardiac segmentation (now Ultromics)*
17. *V. Giuffrida (IMT PhD, 2018), Invariant image representations (now Asst Prof at Univ. of Nottingham)*
18. *I. Oksuz (IMT PhD, 2017), Cardiovascular BOLD MRI joint myocardial segmentation and registration (now Assoc Prof at ITU, Turkey)*
19. *M. Minervini (IMT PhD, 2015), Affordable sensing and application-aware compression (now entrepreneur)*
20. *Z. Chen (NU PhD, 2014), Surveillance aware video transmission [1] (now Google)*
21. *E. Soyak (NU PhD, 2011), Surveillance aware video compression [1] (now CEO at LifeMote)*
22. *F. Yang (NU PhD, 2011), Surveillance analytics and mining [1] (now at Amazon)*
      Co-supervision: [1]Prof. Katsaggelos at Northwestern University (NU) [2] Prof. Tim Hospedales (UoE)
      [3]Prof. Panagakis (Univ of Athens and ARCHIMEDES) and Dr G. Papanastasiou (ARCHIMEDES)

Postdoctoral Research Associate or Staff member (Line Manager) (Italic font denotes alumni)
1. Z. Liu (PhD Leicester, 2025), Causal AI, AI for Science
2. P. Dimitrakopoulos (PhD Greece, 2024), Causal gen AI
3. D. Machlanski (PhD Essex, 2024), Causal discovery, AI for Science
4. D. Bueno, Software Engineer, Causal AI, AI for Science
5. F. Chen (PhD Nottingham, 2022), Foundational AI, AI for Science
6. *M. Camilleri (PhD UoE, 2024), Data assets in Alzheimer's disease (now assistant professor at UoE)*
7. *E. Morosko (PhD Technion, 2021), Causal predictive learning (now at Nethermind*
8. *J. Liu (PhD UoE, 2023), Digital twins for surgery (now Chongqing University China)*
9. *A. Wood (PhD UoE, 2023), Software Engineer (now NatWest Bank)*
10. *F. Haider (PhD Trinity College Dublin, 2018), Shortcuts in representation learning*
11. *J. Hartley (PhD Edinburgh, 2020), Privacy and AI (now NatWest)*
12. *S. Thermos (PhD Greece, 2019), Learning to disentangle (now CodeWheel)*
13. *N. Dionelis (PhD Imperial College, 2019), Deep generative models for anomaly detection (now ESA)*
14. *M. Gegorova (PhD Edinburgh, 2020), Privacy and AI (now Snap, Inc)*
15. *H. Jiang (PhD Liverpool, 2020), Cardiac segmentation (now Lecturer Xi'an Jiaotong-Liverpool University)*
16. *V. Giuffrida (PhD IMT, 2018), Deep learning in computer vision (now Asst Prof at University of Nottingham)*
17. *T. Joyce (PhD UoE 2016), Deep learning in cardiac MRI (now PostDoc at ETH Zurich)*
18. *M. Minervini (PhD IMT 2016), Joint classification and data compression (now Entrepreneur)*
19. *A. Mukhopadhyay (PhD USA 2014), Cardiac MR segmentation (now Junior Research Group Leader, Assistant Professor, TU Darmstadt, Germany)*
20. *M. Bevilacqua (PhD France 2014), Dictionary learning (Data Scientist, Cdiscount France)*
21. *C. Rusu (PhD Romania 2012), Shift-invariant dictionary learning (now Assoc Prof, University of Bucharest)*

MSc, BSc, and Interns (selected)
1. H. Chen (UoE BEng, 2019), *BEng*, Link completion in graphs with deep learning (now PhD at CMU, USA)
2. A. Laurynovich (UoE BEng, 2018), *BEng*, Camera sensors for internet of things (after MSc at U. Essex)
3. F. Chen (UoE MSc, 2017), *MSc,* Crowdsourcing in plant leaf counting **[best dissertation award]** (after PhD at Nottingham, now UoE)
4. T. Xia (UoE MSc, 2017), *MSc,* Compression invariant feature learning **[IDCOM scholarship winner]** (after PhD student at Edinburgh, now Imperial College London)
5. M. Chai (UoE MSc, 2017), *MSc,* Learning to detect rare events
6. S. He (UoE MSc, 2016), *MSc,* Active learning in object counting (now PhD student at Exeter)
7. R. Pei (UoE MSc, 2016), *MSc,* Segmentation of pathology in images from cardiac MRI
8. L. Song (UoE MSc, 2016), *MSc,* Joint compression and classification
9. M. Damiano (IIT, 2012), *Internship*, Image analysis for small animal brain MRI (structural)[2] (now Engineer TBS GB Telematic and Biomedical Services Ltd)
10. L. Dodero (IIT, 2012), *Internship*, Image analysis for small animal brain MRI (DTI)[2] (now Esaote, Genova)
11. K. Hayashi (NU BSc, 2011), *project*, Painting restoration and Illumination correction (now TapSense)
12. B. Cheng (NU BSc, 2011), *project*, DNA thermodynamics (now PepsiCo)
13. D. Babacan (NU MSc, 2009), *Project*, Surveillance analytics and object tracking [1] (now Google)

14. E. Maani (NU MSc, 2009), *Project*, Video Fingerprinting [1] (now Apple)
15. M. Luessi (NU MSc, 2008), *Thesis*, Video Up-rate Conversion [1] (now CEO BrainFPV)
16. R. Chin (NU BSc, 2008), *project*, Cardiac MR image registration (now Abbott Medical)
17. A. Targowska (NU BSc, 2008), *project*, Painting Restoration [1] (now McAndrews, Held & Malloy, Ltd)
18. A. Schlegel and V. Andermatt (NU-HSR, 2007), *thesis*, Visiting scholar from HSR-Rapperswil Switzerland, Cine Cardiac MRI segmentation and tracking [1]
19. D. Shiel (NU MSc, 2007), *Thesis*, AV Speech Recognition with Active Contour [1] (now Verizon)
20. R. Ahuja (NU MSc, 2006), *Thesis*, DNA Microarray Image Analysis [1] (now CTO ZypMedia)
     <u>Co-supervision</u>: [1]Katsaggelos Northwestern University (NU); [2]Gozzi Istituto Italiano di Tecnologia (IIT)

RELATIONSHIPS WITH INDUSTRY

- **Canon Medical Research Europe** (Dr Sutherland, Dr Smout, Dr O'Neil; UK): Healthcare AI
- **Medviso** (Dr Heiberg; Lund, Sweden): Cardiac segmentation and registration
- **Siemens Healthcare** (Dr Zuehlsdorff; USA, Germany): Cardiovascular BOLD MRI imaging/analysis
- **PiCloud Computing Inc.** (now part of Dropbox) (Mr Elkabany, CEO; USA): Large-scale cloud computing in Python (served also as an advisor)

MEDIA COVERAGE

AI for Healthcare
- **Interview STV News (Scotland),** Recorded 20 August 2024 (not yet aired)
- **Interview Greek Huffington Post,** 29 September 2019 (link)

Painting (Matisse) Colorization
- **more than 5000 appearances in online and print media**
- **Interviews and Articles (chronological order):**
  - *The New York Times*, 9 July 2010 (link)
  - *McCormick News*, 12 July 2010 (link)
  - *Northwestern University Front page*, 12 July 2010 (link)
  - MSNBC's Cosmic Log, 12 July 2010 (link)
  - *PhysOrg*, 12 July 2010 (link)
  - *MIT Technology Review*, 19 July 2010 (link)
  - *The Daily Northwestern*, 22 July 2010 (link)
  - *TA NEA*, Greek Newspaper, 31 July 2010 (link)
  - *McCormick Magazine*, Fall 2010 (link)
  - *ΤΕΧΝΟΓΡΑΦΗΜΑ*, (in Greek), Journal of Technical Chamber of Greece, 15 January 2011 (link)
  - *Καθημερινή*, Greek Newspaper, 3 March 2011 (link)

DNA-based digital signal processing
- **more than 3000 appearances in online and print media**
- **Interviews and Articles (chronological order):**
  - *McCormick News*, April 4 2008 (link)
  - *PhysOrg*, April 7 2008 (link)
  - *Science Daily*, April 8 2008 (link)

EXTERNALLY FUNDED PROJECTS (with value in £)

Ongoing:
1. EPSRC (EP/Y028856/1) (**PI**)
   [£12,000,000 total]
   2/24-1/29
   [Causality in Healthcare AI Hub (CHAI)](link)
2. EPSRC (EP/Y030869/1) (School of Engineering **PI, PI: Simpson, Informatics, UoE**)
   [£7,973,042 total]
   4/24-9/32
   [UKRI AI Centre for Doctoral Training in Biomedical Innovation](link)
3. ESRC (UKRI3324) (School of Engineering **PI, PI: Dibben, Geoscience, UoE**)
   [£17,127,387 total]
   3/26 – 3/31
   [ADR Scotland: 2026-2031](link)
4. BHF (RG/F/24/110125) (**School of Engineering PI***, PI: McCann, Leicester*)
   [£1,378,850 total]
   1/25-1/30
   "Understanding progression from asymptomatic type 2 diabetes towards heart failure with preserved ejection fraction through multidimensional phenotyping"

5. Royal Academy of Engineering (RCSRF1819\8\25) (**PI**)
   [£1,333,254: including £189,254 from Royal Academy of Engineering, £625,000 from Canon Medical]
   4/19 – 3/29
   Canon Medical / Royal Academy of Engineering Research Chair in Healthcare AI
6. EPSRC (EP/X033686/1) (**School of Engineering PI**, *PI: Shu, Strathclyde*)
   [£625,005 for School of Engineering; £4,900,000 total]
   9/23-08/27
   Real-time Digital Twin Assisted Surgery

Completed:

7. EPSRC (EP/X017680/1) (**PI**)
   [£250,000]
   02/2023 – 06/2025
   From trivial representations to learning concepts in AI by exploiting unique data
8. EPSRC (EP/Y005376/1) (**co-I**, SoE PI: Kiprakis, *PI: Sun, Durham*)
   [£2,225,788 total]
   5/23-11/25
   Virtual Power Plant with Artificial Intelligence for Resilience and Decarbonisation (VPP-WARD)
9. Kidney Research (KS_RP_012_20221129) (**co-I,** *PI: De Angelis, UoE*)
   [£180,644 total]
   8/23 – 7/25
   Redefining hemodialysis with data-driven materials innovation: towards miniaturization and the wearable artificial kidney
10. *BBSRC* (**School of Engineering PI**, *PI: Pridmore, Nottingham*)
    [£707,500 for SoE; *£2,400,000*]
    2/23-1/25
    PhenomUK Research Infrastructure
11. *National Institutes of Health (USA) (R01HL148788-03)* (**Edinburgh PI**; *PI: Dharmakumar, USA*)
    [$200,000 for School of Engineering; $2,330,000 Total (£1,900,000)]
    6/20-8/24
    Accurate, Needle-Free, MRI-based Detection of Ischemic Heart Disease with Contrast Agents
12. EPSRC-Dstl (EP/S000631/1) (**co-I**; *Overall PI: Davies, UoE*)
    [Total £4,092,206 ScE]
    07/18-06/24
    University Defense Research Collaboration [UDRC] 3: Signal Processing in the Information Age
13. Innovate UK (**School of Engineering PI**; *Edinburgh PI: Parsons*, UoE EPCC; Overall PI: Harrison, St Andrews)
    [£305,458 for School of Engineering; £611,000 for UoE; £16,000,000 total]
    01/19 – 03/23
    Industrial Centre for Artificial Intelligence Research in Digital Diagnostics (iCAIRD)
14. MRC (MR/R025746/1) (**Edinburgh PI**; *Overall PI: Pridmore, Nottingham*)
    [£528,567 total]
    09/18-08/22
    PhenomUK - Crop Phenotyping: from Sensors to Knowledge [A technology touching life network]
15. National Institutes of Health (USA) (R01HL136578) (**Edinburgh PI**; *Overall PI: Dharmakumar, USA*)
    [$200,000 for School of Engineering; $1,700,000M Total (£1,230,000)]
    6/17-8/21
    An Accurate Non-Contrast-Enhanced Cardiac MRI Method for Imaging Chronic Myocardial Infarctions: Technical Developments to Rapid Clinical Validation
16. BBSRC GCRF (BB/P023487/1) (**Engineering PI**; *Overall PI: Doerner, UoE Biology*)
    [£284,558 for School of Engineering; £594,981 UoE Total]
    05/17-10/19
    Improving root system architecture for enhanced drought tolerance and nutrient use efficiency in semi-arid agriculture of chickpea
17. EPSRC First grant (EP/P022928/1) (**PI**)
    [£116,397 ScE]
    09/17-01/19
    CardiacA.I.: Machine learning for the analysis of multimodal cardiac MR images used in the diagnosis of coronary heart disease
18. BBSRC TRDF (BB/N02334X/1) (**Engineering PI**; *Overall PI: McCormick, UoE Biology*)
    [£3,493 for the School of Engineering; £151,637 UoE Total]
    10/16-3/18

    An affordable active photometric system for capturing real-time 3D responses to vegetation dense environments

19. National Institutes of Health (USA) (**Edinburgh PI**, *Overall PI: Dharmakumar*)
    [Transferred to UoE at £41,074; to ST £90,000; Total £1,100,000]
    9/13-9/17
    Reliable Evaluation of Coronary Artery Disease using Myocardial BOLD MRI with CO2
20. Marie Curie International Reintegration Grant (EU-FP7) (**PI**)
    [Total £85,000]
    9/11-9/15
    PHIDIAS: Phenotyping with a High-throughput, Intelligent, Distributed, and Interactive Analysis System
21. PiCloud Computing Inc (San Francisco, USA) (**PI**) (in kind contribution, Industrial)
    [Total 30k in-kind]
    4/12-12/13
    Use of commercial clouds for large-scale analysis
22. CCITT – US Department of Transportation (USA) (**Co-I**, *Overall PI: Katsaggelos*)
    [Total £79,000]
    4/11-12/12
    iTRAC-w: Intelligent Compression and Transmission of Traffic Video
23. CCITT – US Department of Transportation (USA) (**PI**; *co-I: Katsaggelos*)
    [Total £79,000]
    4/09-8/10
    iTRAC: Intelligent Compression of Traffic Video
24. CCITT – US Department of Transportation (USA) (**Co-I**, *Overall PI: Katsaggelos*)
    [Total £79,000]
    1/08-1/10
    Video Traffic Analysis for Abnormal Event Detection
25. The Andrew Mellon Foundation - Art Institute of Chicago (USA) (**Co-I**, *PI: Katsaggelos*)
    [Total £19,000]
    10/07-12/08
    Turning back the hand of time: digital reconstruction of early versions of Matisse's "Bathers by a River"
26. **The San Diego Foundation (USA) (Co-I**, *PI: Katsaggelos*)
    [Total £76,000]
    10/06-4/08
    Universal Microarrays for High Throughput Gene Analysis

LIST OF COURSES TAUGHT (Undergraduate; Graduate)

- **University of Edinburgh (UoE, UK):**
  Coordinator, Machine Learning in Signal Processing (PGEE11175) – MSc   *2019 - Present*
  Lecturer, Electromagnetics, Signals & Communication Systems 3 (ELEE09028) – UG *Winter 2018/2019*
  Lecturer, Advanced Concepts in Signal Processing (PGEE11020) – MSc   *Winter 2017/2018*
  Lecturer, Signals & Communication Systems 3 (ELEE09027) – UG   *Winter 2016/2017*

- **IMT Institute for Advanced Studies (Italy):**
  Coordinator, PhD Curriculum in Image Analysis   CDSS track – G   *Academic years 2012-2014*
  Lecturer, Pattern Recognition and Machine Learning – G   *Academic years 2012-2014*
  Lecturer, Large Scale Image Analysis for Natural and Life Sciences – G   *Academic years 2012-2014*
  Lecturer, Advanced Topics in Image Analysis – G   *Academic years 2013-2014*

- **Northwestern University (USA):**
  Lecturer, Introduction to Electrical Engineering (EECS 202) – U   *Academic years 2008-2010*
  Teaching Assistant, Digital Signal Processing (ECE 359) – UG   *Fall 2003 & Fall 2004*
  Guest Lecturer, Multimedia Signal Processing (ECE 420) – G   *Spring 2005*
  Guest Lecturer, Digital Image Processing (ECE 420) – G   *Winter 2004 & Winter 2005*
  Guest Lecturer, Signals and Systems (EECS 222) – U   *Spring 2003 & Winter 2008*

- **Mediterranean Agronomic Institute of Chania (Greece):**
  Visiting Lecturer, Advanced Topics in Digital Image Analysis (ENM532.1410.3) – G   *June 2013/2014*

- **University of Padova:**
  Visiting Lecturer, Remote Sensing in Agriculture – G (MSc level)   *2015-present*

Summer Schools:
  Wageningen, Computer vision in Agriculture – G (MSc level)   *July 2018*
  Heriot-Watt University / Univ. of Edinburgh, UDRC Summer School – G (MSc level) *June 2019-*

LIST OF PUBLICATIONS

List of publications
Publications are presented in reverse chronological order. When possible, links to available preprints are indicated as [PDF] or [preprint]; links to the publishers' websites are indicated as [Full text].
Preprints can also be found at https://vios.science/publications
Code to reproduce experiments when available is here: https://vios.science/code_and_data
Underlined names indicate (ex or current) student/RA/postdoc.

Each paper contains in brackets [IF: XX] where XX denotes impact factor (2021) when available. For citation counts see Google Scholar).

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CONFERENCE TALKS AND INVITED PRESENTATIONS (SELECTED)

Invited Keynotes, Tutorials and Conference Presentations
1. "The pursuit of generalisation with real data" Keynote, MIUA 2022 (26th UK Conference on Medical Image Understanding and Analysis), July 2022. [link]
2. "The pursuit of generalisation with real data", Center for Statistics Annual Conference, June 2022, Host: Prof. Elvira.
3. "DREAM: Disentangled Representations for Efficient Algorithms for Medical data" an 24th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2021 Tutorial, October 2021. [link]
4. "How should we create algorithms to do more with less?" Keynote, IMPROVE 2021 (International Conference on Image and Vision Engineering), April 2021. [link]
5. "Doing more with less by learning better data representations", Invited talk, Hessian.AI, Nov. 2020. [link]
6. "DREAM: Disentangled Representations for Efficient Algorithms for Medical data" an 23rd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) 2020 Tutorial, October 2020. [link]
7. "Disentangled representation learning data in medical imaging", Keynote, DART@MICCAI, Oct 2020.
8. "Disentangled representation learning data in healthcare", Invited talk, ICLR workshop on AI for Affordable healthcare, April 2020.
9. "Disentangled representation learning data in medical imaging", Keynote, STACOM, October 2019.
10. "Healthcare AI", Invited Lecture, British Embassy, Japan Tokyo, October 2019, host: Scottish Enterprise and Canon Medical.
11. "Simulation and Synthesis" an International Conference on Acoustics Speech and Signal Processing (ICASSP) 2019 Tutorial, May 2019.
12. "Machine learning in phenotyping: doing more with less", Keynote, Gatersleben Scientific Conference 2019, Gatersleben, Germany, Mar 2019.
13. "Joint motion compensation and myocardial segmentation with shallow and deep models", Invited talk, SCMR/ISMRM workshop on The Emerging Role of Machine Learning in Cardiovascular Magnetic Resonance Imaging, Seattle, USA, Feb 2019.
14. "Multimodal deep learning in biomedical image analysis", Keynote, International Conference on Artificial Neural Networks, Rhodes, Greece, Oct 2018,
15. "Deep (machine) learning in phenotyping", Keynote, Phenome 2018, Arizona, USA, Feb 2018.
16. "Machine learning can empower trait extraction in affordable phenotyping", Invited talk, IPPN Affordable Phenotyping Workshop, Jülich, Germany, May 2017.
17. "Computer Vision and Plant Phenotyping -a match made in heaven", Keynote at British Machine Vision Association (BMVA) technical meeting on: Plants in Computer Vision, Nov. 2016.
18. "Easy Plant Phenomics," Invited Talk Scientific support to agriculture: competitiveness, quality and sustainability, European Commission, Joint Research Center, Athens, Greece, April 2014.
19. "DNA-Based Digital Signal Processing and its Application to Engineering Problems," Plenary, *First International Meeting on Applications of DNA Computing to Engineering Problems*, Meiji University, Tokyo, Japan, Sept. 2005.

Invited Seminar Presentations
20. "The pursuit of generalisation with real data", National University of Singapore, Sept 2022, Host: Prof. See-Kiong Ng.
21. "The building blocks of a Big AI in healthcare", King's College London, April 2022, Host: Prof. Young.
22. "The ingredients of a Big AI in healthcare", DKFZ, March 2022, Host: Prof. Maier-Hein.
23. "When big data are not big enough: building AI to do more with less," University of Pennsylvania, May 2021, Host. Prof. Bakas.
24. "Doing more with less by disentangled data representations", EXCITE ETH, Dec. 2020, [link]. Host: Prof. Konukoglu
25. "Disentangled representation learning in medical imaging", U of Edinburgh Informatics, March 2020, Host: Dr. Onken.
26. "Disentangled representation learning in healthcare", U of Glasgow, Jan 2020, Host: Prof. Murray-Smith.
27. "Multimodal biomedical image analysis," Usher Informatics Institute, Sept 2019, Host: Prof. Sudlow.
28. "Multimodal biomedical image analysis," King's College London, May 2019, Host: Dr. King.
29. "Learning to synthesize signals and images," Bristol Vision Institute, 17 Nov 2017, Host: Prof. Bull.
30. "Phenotyping, computer vision, and sensing -a match made in heaven", Queen Mary University London, Host: Prof. Cavallaro, Nov. 2016.
31. "Affordable imaging of plants and trait analysis with Phenotiki", Science and Advice for Scottish Agriculture (SASA), Host: Prof. Sadler, June 2016.
32. "Towards automated pixel-wise detection and visualization of area at risk at rest without contrast agents using cardiac BOLD MRI", Cedars Sinai Medical Center, Host: Dharmakumar, Jan 2016.

33. "Personalized 'needle-free' imaging for cardiac MRI," Yale University, Host: Prof. Papademetris, Jan 2016.
34. "Affordable plant phenotyping: the challenges and opportunities," The University of Nottingham, Host: Prof. Pridmore, Nov. 2015.
35. "Personalized 'needle-free' imaging for cardiac MRI," Univ. of Sheffield, Host: Prof. Frangi, Nov. 2015.
36. " 'Needle free' ischemia assessment with cardiac BOLD MRI**,**" Queens Medical Research Institute (Edinburgh), Host: Dr Semple, Nov. 2015.
37. "Computer Vision and Phenotyping-A Match Made in Heaven", Italian Institute of Technology, Host: Prof. Murino, June 2015.
38. "Towards personalized 'one button imaging' for cardiac MRI," The University of Edinburgh, Host: Dr. Safari, June 2015.
39. "Affordable plant phenotyping: the challenges and opportunities," Juelich, Host: Dr. Scharr, Dec. 2014.
40. "Affordable Plant Phenotyping," ENEA C.R. Casaccia UTAGRI - Green Biotechnologies Laboratory, Host: Dr. Giuliano, April 2013.
41. "Imaging-based phenotyping for life sciences," Dip. di Ingegneria dell'Informazione Università di Siena, Host: Prof. Gori, March 2012.
42. "Intelligent Video Compression for Tracking Applications," Dip. di Elettronica - Politecnico di Torino, Host: Prof. Magli, June 2010.
43. "Research in the intersection of signal processing and life sciences: From DNA and AFM, to MRI and back," *University of Pennsylvania*, Dept. of Radiology, Host: Prof. Davatzikos, July 2008.
44. "Digital Signal Processing and Life Sciences: A Multiview Perspective," *University of Chicago*, Dept. of Ecology and Evolution, Host: Prof. Borevitz, April 2008.
45. "The Molecular and Organic Future of Digital Signal Processing," *University of Illinois at Chicago*, Dept. of Electrical and Computer Engineering, Host: Dr. Schonfeld, Oct 2007.
46. "Simulations of DNA based storage of digital signals," University of Tokyo, Japan, Host: Prof. Suyama, Sept 2005.
47. "The Molecular Future of Digital Signal Processing":
    a. *Hong Kong University of Science & Technology*, Hong Kong, Host: Prof. Au, Sept 2005.
    b. *Uppsala University*, Uppsala Sweden, Host: Prof. Stoika, Aug 2005.
    c. *Ericsson Research,* Kista Sweden, Host: Dr. Karlsson, Aug 2005.
48. "DNA-Based Digital Signal Processing: Theory and Applications," *1st Kellogg Nanobusiness Conference: Exploring Opportunities in Nanobusiness*, Evanston, IL, USA, April 2004.
49. "DNA Computing: Applications in DSP, Security and Biotechnology," *Integrated Genomics*, Chicago, IL, Host: Dr. Kyrpides, March 2004.

SOFTWARE AND DATASETS

Most of our code is made available here: https://vios.science/code_and_data/ otherwise see below:

- **Disentangled learning:** code for learning disentangled representations in biomedical data https://github.com/agis85/anatomy_modality_decomposition
- **Factorised learning:** code for learning factorised representations in biomedical data https://github.com/agis85/spatial_factorisation
- **Disentangled temporal learning:** code for learning disentangled representations in biomedical data with temporal dynamics https://github.com/gvalvano/sdtnet
- **Pheno-Deep-Counter:** A deep learning based multi-instance multimodal object counter https://bitbucket.org/tuttoweb/pheno-deep-counter
- **Multimodal Brain Synthesis:** Tensorflow implementations of several of our papers on synthesis https://github.com/agis85/multimodal_brain_synthesis
- **Restricted Boltzmann Machine Matlab Toolbox:** A toolbox implementing various forms of RBMs https://bitbucket.org/teamrbm/rbm
- **Phenotiki:** Open-source open hardware platform for affordable plant phenotyping http://phenotiki.com, as of now has been downloaded by 100 users and is actively used by 30 labs in the world
- **The PRL – CVPPP dataset:** A collection of annotated data for computer vision research in plant phenotyping https://www.plant-phenotyping.org/datasets, as of now it has been downloaded 2000 times, and cited 54 times.
- **Circulant Dictionary Learning:** An explicit formulation to shift invariant dictionary learning in MATLAB, till Sept 2016, the software has been used by 40 researchers.
- **Mouse MRI Phenotyping:** A collection of pipelines (scripts) for mouse phenotyping based on ANTs
- **Large Scale Image Analysis on Commercial Clouds:** A collection of python functions for PiCloud
- **A toolbox for Plant Phenotyping:** A MATLAB and Bisque-iPlant hosted implementation for plant segmentation and analysis
- **TiXiS-PiXiS:** DNA thermodynamics toolbox for MATLAB. [on request]