http://vios.science

SOTIRIOS A. TSAFTARIS, Ph.D.

Chair in Machine Learning and Computer Vision

S.Tsaftaris@ed.ac.uk

TRACK RECORD SUMMARY

- A proven **leader** capable on leading strategic national initiatives (e.g. the CHAI AI hub).
- **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 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 (£28.7m, 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

Director Causality in Healthcare AI Hub (CHAI) The University of Edinburgh *Feb 2024 – 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)**,** *August 2019 – Present*
The University of Edinburgh

Chancellor's Fellow and Reader (US equiv. Associate Professor)**,** *August 2018 – July 2019*
The University of Edinburgh

Turing Fellow, The Alan Turing Institute *September 2017 – Present*

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) *July 2012 – Oct 2016*
Pattern Recognition and Image Analysis Unit (PRIAn)

Assistant Professor, IMT Institute for Advanced Studies Lucca (Italy) *September 2011 – 2015*
Area of Computer Science and Applications

Adjunct Assistant Professor, Northwestern University (USA) *July 2011 – Sept 2016*
Departments of Electrical Engineering and Computer Science and Radiology, Feinberg School of Medicine

Research Assistant Professor, Northwestern University (USA) *January 2009 – July 2011*
Department of Radiology, Feinberg School of Medicine

Research Assistant Professor, Northwestern University (USA) *November 2006 – July 2011*
Department of Electrical Engineering and Computer Science

Visiting Researcher, Meiji University (Japan) *September 2005*
Institute of Applied DNA Computing, Kanagawa-Ken

Research Assistant, Northwestern University (USA) *July 2002 – July 2006*
Department of Electrical Engineering and Computer Science, Image & Video Processing Laboratory

Graduate Researcher, CERTH (Greece) *September 2000 – July 2001*
Informatics & Telematics Institute, Center for Research and Technology Hellas (CERTH) Greece

AWARDS AND HONORS

Inward Investment Award (to Canon Medical and University of Edinburgh) *2025*
INTERFACE
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. I. Stogiannidis (UoE PhD, -) Vision language models
2. A. Cabello Cano (UoE PhD, -) Active causal AI
3. N. Gkouti (UoAthens PhD, -) Causal optimisation [3]
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. Bolland (UoE EngD, -), Learning with less [industry co-funded]
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. *X. Tian (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. P. Dimitrakopoulos (PhD Greece, 2024), Causal gen AI
2. D. Machlanski (PhD Essex, 2024), Causal discovery
3. M. Camilleri (PhD UoE, 2024), Data assets in Alzheimer's disease
4. E. Morosko (PhD Technion, 2021), Causal predictive learning
5. J. Liu (PhD UoE, 2023), Digital twins for surgery
6. A. Wood (PhD UoE, 2023), Software Engineer
7. D. Bueno, Software Engineer
8. F. Chen (PhD Nottingham, 2022), AI in agriculture and data management
9. *F. Haider (PhD Trinity College Dublin, 2018), Shortcuts in representation learning*
10. *J. Hartley (PhD Edinburgh, 2020), Privacy and AI (now NatWest)*
11. *S. Thermos (PhD Greece, 2019), Learning to disentangle (now CodeWheel)*
12. *N. Dionelis (PhD Imperial College, 2019), Deep generative models for anomaly detection (now ESA)*
13. *M. Gegorova (PhD Edinburgh, 2020), Privacy and AI (now Snap, Inc)*
14. *H. Jiang (PhD Liverpool, 2020), Cardiac segmentation (now Lecturer Xi'an Jiaotong-Liverpool University)*
15. *V. Giuffrida (PhD IMT, 2018), Deep learning in computer vision (now Asst Prof at University of Nottingham)*
16. *T. Joyce (PhD UoE 2016), Deep learning in cardiac MRI (now PostDoc at ETH Zurich)*
17. *M. Minervini (PhD IMT 2016), Joint classification and data compression (now Entrepreneur)*
18. *A. Mukhopadhyay (PhD USA 2014), Cardiac MR segmentation (now Junior Research Group Leader, Assistant Professor, TU Darmstadt, Germany)*
19. *M. Bevilacqua (PhD France 2014), Dictionary learning (Data Scientist, Cdiscount France)*
20. *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. X. Tian (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)

Co-supervision: [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)
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
3. 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"
4. 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
5. EPSRC (EP/X017680/1) (**PI**)
   [£250,000]
   02/2023 – 06/2025
   From trivial representations to learning concepts in AI by exploiting unique data
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

7. 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)
8. 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

Completed:

9. *BBSRC* (**School of Engineering PI***, PI: Pridmore, Nottingham*)
   [£707,500 for SoE; *£2,400,000]*
   2/23-1/25
   PhenomUK Research Infrastructure
10. *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
11. 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
12. 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)
13. 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]
14. 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
15. 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
16. 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
17. 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
18. 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
19. 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

20. 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
21. 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
22. CCITT – US Department of Transportation (USA) (**PI**; *co-I: Katsaggelos*)
    [Total £79,000]
    4/09-8/10
    iTRAC: Intelligent Compression of Traffic Video
23. 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
24. 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"
25. 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 (**U**ndergraduate; **G**raduate)

- **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).

Refereed International Journals

1. K.A. McLean, A. Sgrò, L.R. Brown, L.F. Buijs, K.E. Mountain, C.A. Shaw, T.M. Drake, R. Pius, S.R. Knight, C.J. Fairfield, R. J.E. Skipworth, S.A. Tsaftaris, S.J. Wigmore, M.A. Potter, M.-M. Bouamrane, E.M. Harrison, "Multimodal machine learning to predict surgical site infection with healthcare workload impact assessment," *npj Digital Medicine* vol 8, Article number: 121 2025 [Full text]
2. L. Asciak, J. Kyeremeh, X. Luo, A. Kazakidi, P. Connolly, F. Picard, K. O'Neill, S.A. Tsaftaris, G. D. Stewart, W. Shu, "Digital twin assisted surgery, concept, opportunities, and challenges," *npj Digital Medicine* vol 8, Article number: 32 2025 [Full text]
3. M Qais, D Kirli, E Moroshko, A Kiprakis, S Tsaftaris, "A virtual power plant for coordinating batteries and EVs of distributed zero-energy houses considering the distribution system constraints," *Journal of Energy Storage*, 2025 [Full text]
4. Sun J, Wei D, Xu Z, Lu D, Liu H, Wang H, Tsaftaris SA, McDonagh S, Zheng Y, Wang L. Unlocking the Potential of Weakly Labeled Data: A Co-Evolutionary Learning Framework for Abnormality Detection and Report Generation. *IEEE Trans Med Imaging*. 2024 Dec 13;PP. doi: 10.1109/TMI.2024.3516954. [Preprint] [Full text]
5. K Vilouras, P Sanchez, AQ O'Neil, SA Tsaftaris, "Zero-Shot Medical Phrase Grounding with Off-the-shelf Diffusion Models," IEEE Journal of Biomedical and Health Informatics, 2024 [Full text]
6. Z. Liu, B. Yang, Y. Shen, X. Ni, S.A. Tsaftaris, H. Zhou, "Long-short diffeomorphism memory network for weakly-supervised ultrasound landmark tracking," *Medical Image Analysis* 94, 103138 [Full text]
7. L. Maier-Hein et al, "Understanding metric-related pitfalls in image analysis validation," *Nature Methods*, vol. 21, pp. 182–194, 2024. [preprint] [Full text]
8. A. Reinke et al, "Metrics reloaded: recommendations for image analysis validation," *Nature Methods*, vol. 21, pp. 195–212, 2024. [preprint] [Full text]
9. X. Liu, P. Sanchez, S. Thermos, A.Q. O'Neil, S.A. Tsaftaris, "Compositionally Equivariant Representation Learning," *IEEE Trans Medical Imaging* 2024. [preprint] [Full text]
10. P. Sanchez, J. Hartley, F. Haider, S.A. Tsaftaris, "Measuring Unintended Memorisation of Unique Private Features in Neural Networks," *Nature Scientific Reports*, 2023 [preprint]
11. A. Kascenas, P. Sanchez, P. Schrempf, C. Wang, W. Clackett, S.S. Mikhael, J.P. Voisey, K. Goatman, A. Weir, N. Pugeault, S.A. Tsaftaris, A.Q. O'Neil, "The role of noise in denoising models for anomaly detection in medical images" Medical Image Analysis 90, 102963 [Full text] [preprint]
12. S. Pati, S. P. Thakur, M. Bhalerao, S. Thermos, U. Baid, K. Gotkowski, C. Gonzalez, O. Guley, I. Ethem Hamamci, S. Er, C. Grenko, B. Edwards, M. Sheller, J. Agraz, B. Baheti, V. Bashyam, P. Sharma, B. Haghighi, A. Gastounioti, M. Bergman, A. Mukhopadhyay, S. A. Tsaftaris, B. Menze, D. Kontos, C. Davatzikos, S. Bakas, "GaNDLF: A Generally Nuanced Deep Learning Framework for Scalable End-to-End Clinical Workflows in Medical Imaging," *Nature Communications Engineering*, 2023 [preprint]
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192. R.B. Uriarte, S. Tsaftaris, F. Tiezzi, "Service Clustering for Autonomic Clouds Using Random Forest," 2015 *15th IEEE/ACM International Symposium in Cluster, Cloud and Grid Computing (CCGrid)*, pp.515-524, 4-7 May 2015. [Full text]
193. M. Minervini, C. Rusu, S.A. Tsaftaris, “Unsupervised and Supervised Approaches to Color Space Transformation for Image Coding,” *IEEE International Conference on Image Processing (ICIP)*, Paris, France, 2014. [PDF]
194. C. Rusu, S.A. Tsaftaris, “Structured Dictionaries for Ischemia Estimation in Cardiac BOLD MRI at Rest,” *MICCAI*, Boston 2014. 2014;17(Pt 2):562-9. PMID: 25485424 [Full text] [PDF]
195. C. Rusu, R. Dharmakumar, S.A. Tsaftaris, “A Synthetic Generator of Myocardial Blood-Oxygen-Level-Dependent MRI Timeseries with Structural Sparse Decomposition Modeling,” *ISMRM*, Milan Italy 2014.
196. D. Boschetto, C. Rusu, R. Dharmakumar, S.A. Tsaftaris, “Temporal and Spatial Variation of Baseline Myocardial BOLD Signal Intensity in Cardiac Phase-Resolved BOLD MRI: A Potentially Revealing Insight into Dynamic Changes in Myocardial Oxygenation,” *ISMRM*, Milan Italy 2014.
197. R. Morisi, R. Dharmakumar, S.A. Tsaftaris, “Unsupervised Ischemia Detection at Rest with CP-BOLD Cardiac MRI: A Simulation Study Employing Independent Component Analysis,” *ISMRM*, Milan Italy 2014. (**Magna Cum Laude Award**)
198. H. Yang, R. Yumul, R.L. Tang, I. Cokic, M. Klein, A. Kali, O. Sobczyk, B. Sharif, J. Tang, X. Bi, S.A. Tsaftaris, D. Li, J. Min, D.S. Berman, A.H. Conte, J. Fisher, R. Dharmakumar, “Probing Myocardial Blood Oxygenation Reserve of Canines with Controlled Hypercapnia using T2-prepared BOLD CMR,” *ISMRM*, Milan Italy 2014.
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201. Cokic I, Kali A, Yang H, Tang RL, *S.A. Tsaftaris*, Dharmakumar R. "Impact of Chronic Iron Deposition Following Myocardial Infarction on Gross Electrical Characteristics," *Heart Rhythm Society 35th Annual Scientific Sessions 2014 (San Francisco, USA)*.
202. H. Yang, R. Yumul, R.L. Tang, I. Cokic, M. Klein, A. Kali, O. Sobczyk, B. Sharif, J. Tang, X. Bi, S.A. Tsaftaris, D. Li, J. Min, D.S. Berman, A.H. Conte, J. Fisher, R. Dharmakumar, "Probing Myocardial Blood Oxygenation Reserve with Controlled Hypercapnia using BOLD CMR," *Journal of Cardiovascular Magnetic Resonance. 2013; 16(Suppl 1): O14 (SCMR 17th Annual Scientific Sessions, New Orleans, USA)*. [Full text]
203. M. Minervini, C. Rusu, S.A. Tsaftaris, "Learning Computationally Efficient Approximations of Complex Image Segmentation Metrics," 8th International Symposium on Image and Signal Processing and Analysis ISPA 2013 Trieste (Italy), September 4 - 6, 2013, pp. 60 - 65. [Full text]
204. C. Rusu, S.A. Tsaftaris, "Estimation of Scribble Placement for Painting Colorization," 8th International Symposium on Image and Signal Processing and Analysis ISPA 2013 Trieste (Italy), September 4 - 6, 2013, pp. 564 - 569. [Full text] [PDF]
205. M. Minervini, S.A. Tsaftaris, "Application-Aware Image Compression for Low Cost and Distributed Plant Phenotyping," 18th International Conference on Digital Signal Processing (DSP), Santorini, Greece, 2013. [Full text] [PDF]
206. M.M. Abdelsamea, S.A. Tsaftaris, "Active Contour Model driven by Globally Signed Region Pressure Force," 18th International Conference on Digital Signal Processing (DSP), Santorini, Greece, 2013. [Full text] [PDF]
207. A. Kali, I. Cokic, A. Kumar, S.A. Tsaftaris, R. Tang, M. Friedrich, R. Dharmakumar "Acute Hemorrhagic Myocardial Infarction Leads to Localized Chronic Iron Deposition: A CMR Study," *ISMRM 21st Annual Meeting*, Salt Lake City, USA, 2013.
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211. Z. Chen, E. Soyak, S.A. Tsaftaris, A. K. Katsaggelos, "Tracking-Optimal Error Control Schemes for H.264 Compressed Video for Vehicle Surveillance," *European Signal Processing Conference (EUSIPCO),* Sept. 2012. [Full text]
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213. S.A. Tsaftaris, X. Zhou, R. Tang, J. Min, D. Li, R. Dharmakumar, "Detecting ACS and Identifying Acute Ischemic Territories with Cardiac Phase-Resolved BOLD MRI at Rest," *The 20th Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM)*, Australia, 2012. (**Magna Cum Laude Award**)
214. S.A. Tsaftaris, X. Zhou, R. Tang, D. Li, R. Dharmakumar, "Detecting Myocardial Ischemic Territories in the Setting of Acute Coronary Obstructions at Rest with Cardiac Phase-Resolved Blood Oxygen Level Dependent (CP-BOLD) MRI," *American Heart Association Scientific Sessions 2011* [Full text]
215. S.A. Tsaftaris, "PHIDIAS: Plant Phenotyping with a High-throughput, Intelligent, Distributed, and Integrated Analysis System," *2nd International Plant Phenotyping Symposium*, Juelich, Germany, Sept. 5-7, 2011.
216. E. Soyak, S.A. Tsaftaris, A. K. Katsaggelos, "Tracking-Optimized Quantization for H.264 Compression in Transportation Video Surveillance Applications," *IEEE International Conference on Image Processing (ICIP 2011), Brussels, Belgium, Sept. 11-14, 2011*. [PDF]
217. E. Soyak, S.A. Tsaftaris, A. K. Katsaggelos, "Channel Protection for H.264 Compression in Transportation Video Surveillance Applications," *IEEE International Conference on Image Processing (ICIP 2011), Brussels, Belgium, Sept. 11-14, 2011*. [PDF]
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221. S.A. Tsaftaris, X. Zhou, R. Dharmakumar, “A Fully Automated Statistical Method for Characterization of Flow Artifact Presence in cardiac MRI,” *SCMR*, 2011, vol. 13 (Suppl 1): P45, Feb. 2011. [Full text]
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225. E. Soyak, S.A. Tsaftaris, A.K. Katsaggelos, “Content-Aware H.264 Encoding for Traffic Video Tracking Applications,” *35th International Conference on Acoustics, Speech, and Signal Processing (ICASSP)* Dallas, TX, March 14 – 19, 2010, pp. 730 – 733. [PDF]
226. R. Dharmakumar, Z. Zhang, I. Koktzoglou, S.A. Tsaftaris, D. Li, “Dual Contrast Cellular MRI,” *18th Meeting of the ISMRM*, Stockholm, Sweden, 2010.
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232. X. Zhou, S.A. Tsaftaris, Y. Liu, R. Tang, R. Klein, S. Zuehlsdorff, D. Li, R. Dharmakumar, “Myocardial BOLD imaging using flow compensated 2D cine bSSFP,” *18th Meeting of the ISMRM*, Stockholm, Sweden, 2010.
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234. S.A. Tsaftaris, X. Zhou, R. Tang, D. Li, R. Dharmakumar, “Automated detection and quantification of microcirculatory oxygenation changes in the heart,” *SCMR*, vol. 12, Suppl 1, pp. P216+, 2010. [Full text]
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237. S.A. Tsaftaris, C. Noutsos, “Plant Phenotyping with Low Cost Digital Cameras and Image Analytics,” in Proceedings of the *4th International Symposium on Information Technologies in Environmental Engineering*, Thessaloniki, Greece, May 2009, Springer Berlin Heidelberg, pp. 238 – 251, 2009. [PDF]
238. S.A. Tsaftaris, X. Zhou, R. Tang, R. Klein, R. Dharmakumar, “An Intensity Based Statistical Approach for Left Ventricular Localization and Identification of End-Systolic and End-Diastolic Images from Cine Cardiac MRI,” *17th Meeting of the ISMRM*, Hawaii, 2009.
239. S.A. Tsaftaris, R. Tang, R. Klein, D. Li, R. Dharmakumar, “Visualizing and Quantifying Myocardial Oxygenation Changes with Statistically Optimal Colormaps,” *17th Meeting of the ISMRM*, Hawaii, 2009.
240. R. Dharmakumar, I. Koktzoglou, S.A. Tsaftaris, S. Zuehlsdorff, R. Tang, G. Wright, D. Li, “Visualization and Tracking of a Conventional Guidewire with Low Flip Angle SSFP Imaging: An Initial Study,” *17th Meeting of the ISMRM*, Hawaii, 2009.
241. S.A. Tsaftaris, X. Zhou, R. Tang, R. Klein, R. Dharmakumar, “An Automated Method for Left Ventricular Localization and Identification of End-Systolic and End-Diastolic Images from Cine Cardiac MRI,” *SCMR* 2009, vol. 11, Suppl 1, P222. [Full text]
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243. X. Zhou, R. Tang, R. Klein, S.A. Tsaftaris, D. Li, R. Dharmakumar, “Impact of Temporal Resolution on Cardiac Phase-Resolved Oxygen-Sensitive Myocardial Steady-State Free Precession Imaging,” *SCMR*, Florida, 2009, vol. 11, Suppl 1, P178. [Full text]

244. S.A. Tsaftaris, J. Zujovic, A.K. Katsaggelos, “Restoration of the Cantilever Bowing Distortion in Atomic Force Microscopy,” *16th European Signal Processing Conf.*, Lausanne, Switzerland, Aug. 2008.[PDF] [2C]
245. S.A. Tsaftaris, J. Zujovic, and A.K. Katsaggelos, “Automated Line Flattening of Atomic Force Microscopy Images,” *ICIP*, 2008, pp 2968-2971. [PDF]
246. E. Maani, S.A. Tsaftaris, A.K. Katsaggelos, “Local Feature Extraction for Video Copy Detection in a Database,” *ICIP*, San Diego, CA, 2008, pp. 1716-1719. [PDF]
247. S. A. Tsaftaris, V. Andermatt, A. Schlegel, A. K. Katsaggelos, D. Li, R. Dharmakumar, “A Dynamic Programming Solution to Tracking and Elastically Matching Left Ventricular Walls in Cardiac CINE MRI,” *ICIP*, San Diego, CA, 2008, pp. 2980-2983. [PDF]
248. I. Koktzoglou, S. A. Tsaftaris, S. Zuehlsdorff, D. Li, A. K. Katsaggelos, and R. Dharmakumar, “Automated Tracking of a Passive Endomyocardial Stiletto Catheter with Dephased FLAPS MRI: A Feasibility Study,” *16th Meeting of the ISMRM*, May 2008. [PDF]
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250. S.A. Tsaftaris, R. Ahuja, D. Shiell, A.K. Katsaggelos, “DNA Microarray Image Intensity Extraction Using Eigen-spots,” *ICIP*, Sept. 16-19 2007, San Antonio Texas, vol. VI, 2007, pp. 265-268. [PDF]
251. S.A. Tsaftaris, A.K. Katsaggelos, “Retrieval Accuracy of Very Large DNA-Based Databases of Digital Signals,” *Proc. of 2007 European Signal Processing Conference*, Poznań, Polland, Sept. 3-7, 2007. [PDF]
252. S. A. Tsaftaris, V. Hatzimanikatis, A. K. Katsaggelos, “DNA as a medium for storing digital signals,” in *Proc. of 10th International Conference on the Simulation and Synthesis of Living Systems*, L. M. Rocha et al, Eds., vol. 1, June 2006, pp. 303–309. [PDF]
253. S.A. Tsaftaris, V. Hatzimanikatis, A.K. Katsaggelos, “DNA Hybridization as a Similarity Criterion for Querying Digital Signals Stored in DNA Databases”, *ICASSP*, Toulouse, France, May 14-19, vol. 2, pp. II-1084 - II-1087, 2006. [PDF]
254. (invited) S.A. Tsaftaris, A.K. Katsaggelos, “On Designing DNA Databases for the Storage and Retrieval of Digital Signals,” in *Proc. of International Conference on Natural Computation, special session on Recent Advances in Biomolecular Computing, Changsha, China, August 26-29, 2005*, Lecture Notes in Computer Science, vol. 3611, pp. 1192-1201, Jul 2005. [PDF]
255. S.A. Tsaftaris, A.K. Katsaggelos, “A New Codeword Design Algorithm for DNA Based Storage and Retrieval of Digital Signals,” in *Proc. 11th International Meeting on DNA-based Computers DNA 11*, London, Ontario, Canada, 2005.
256. S.A. Tsaftaris, A.K. Katsaggelos, T.N. Pappas and E.T. Papoutsakis, “DNA Based Matching of Digital Signals,” ICASSP, Montreal, Quebec, Canada, May 17-21 2004, vol. 5, pp. 581-584 [PDF]
257. D. Simitopoulos, S.A. Tsaftaris, N.V. Boulgouris and M.G. Strintzis: “Fast MPEG Watermarking for Copyright Protection,” in *Proc. of IEEE Int. Conf. on Electronics, Circuits and Systems (ICECS 2002)*, Dubrovnik, Croatia, vol. 3, pp. 1027-1030, Sept. 2002. [PDF]
258. D. Simitopoulos, S.A. Tsaftaris, N.V. Boulgouris, M.G. Strintzis: “Compressed-domain Video Watermarking of MPEG Streams,” in *Proc. of IEEE Int. Conf. on Multimedia and Expo (ICME 2002)*, Lausanne, Switzerland, vol. 1, pp. 569 -572, Aug. 2002. [PDF]
259. D. Simitopoulos, S.A. Tsaftaris, N.V. Boulgouris, M.G. Strintzis: “Fast compressed domain watermarking of MPEG multiplexed streams,” in *Proc. of Information and Knowledge Management for Integrated Media Communication Workshop*, Madrid, Spain, Nov. 2001. [PDF]
260. D. Simitopoulos, S.A. Tsaftaris, N.V. Boulgouris, M.G. Strintzis: “Digital watermarking of MPEG-1 & MPEG-2 multiplexed streams for copyright protection,” in *Proc. of IEEE Int. Workshop on Digital & Computational Video (DCV 2001)*, Tampa, Florida, USA, pp. 140-147, Feb. 2001. [PDF]

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]