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

http://vios.science

S.Tsaftaris@ed.ac.uk

TRACK RECORD SUMMARY

- **Expertise** on machine learning theory and computational methods. Research focus in: representation learning, multimodal learning, 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).
- **190+ publications** of multidisciplinary character in peer reviewed journals (highly ranked in medical image analysis and imaging) and conferences. Average impact factor = 6.1; h-index = 38 (Google Scholar).
- 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 (5 current; 5 awarded) and research staff (current 2; alumni 8).

EDUCATION

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

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

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

CURRENT EMPLOYER

Address: IDCOM-Institute of Digital Communications, School of Engineering, Room 2.06, Alexander Graham Bell Building, The King's Buildings, Thomas Bayes Rd, Edinburgh EH9 3FG, 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:
  o develop a research program in machine learning and data science with applications in medicine, biology, and natural sciences;
  o solicit funding, and recruit research staff; and
  o supervise and mentor team members.
- As a faculty:
  o participate in various committees and exam boards; and
  o teach courses at the undergraduate/post-graduate level (Electrical Engineering Discipline)

EMPLOYMENT HISTORY

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

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

PROFESSIONAL AND ACADEMIC ACTIVITIES

Participation in Executive/Advisory Boards   *2019 – Present*
- INCISE - **IN**tegrated **TeC**hnologies for **I**mproved Polyp **S**urveillanc**E** (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 the Engineering and Physical Sciences Research Council, 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*

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 - Medical Image Computing and Computer Assisted Interventions (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

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 Engineering in Greece (Technical Chamber of Greece)   *November 2000 – 2011*
Hellenic Association of Mechanical & Electrical Engineers   *November 2000 – 2011*

UNIVERSITY SERVICE

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)
1. K. Vilouras, (UoE PhD, -), Invariant Representations for multiple environments
2. P. Sanchez (UoE PhD, -), Causal machine learning
3. X. Liu (UoE PhD, -), Learning to disentangle
4. C. Bolland (UoE EngD, -), Learning with less [industry co-funded]
5. G. Jacenkow (UoE PhD, -), Deep learning for clinical decision support [industry co-funded]
6. X. Tian (UoE PhD, 2022), Pseudo healthy synthesis as a latent variable (now Imperial College London)
7. A. Chartsias (UoE PhD, 2020), Multimodal cardiac segmentation (now Ultromics)
8. V. Giuffrida (IMT PhD, 2018), Invariant image representations (now Lecturer at Napier University)
9. I. Oksuz (IMT PhD, 2017), Cardiovascular BOLD MRI joint myocardial segmentation and registration (now Assoc Prof at ITU, Turkey)
10. M. Minervini (IMT PhD, 2015), Affordable sensing and application-aware compression (now entrepreneur)
11. Z. Chen (NU PhD, 2014), Surveillance aware video transmission [1] (now Google)
12. E. Soyak (NU PhD, 2011), Surveillance aware video compression [1] (now CEO at LifeMote)
13. F. Yang (NU PhD, 2011), Surveillance analytics and mining [1] (now at Amazon)
    Co-supervision: [1]Prof. Katsaggelos at Northwestern University (NU)

Postdoctoral Research Associate (Line Manager)
1. F. Chen (PhD Nottingham, 2022), AI in agriculture and data management
2. F. Haider (PhD Trinity College Dublin, 2018), Shortcut learning in representations
3. J. Hartley (PhD Edinburgh, 2020), Privacy and AI (now NatWest)
4. S. Thermos (PhD Greece, 2019), Learning to disentangle (now CodeWheel)
5. N. Dionelis (PhD Imperial College, 2019), Deep Generative Models for Anomaly Detection
6. M. Gegorova (PhD Edinburgh, 2020), Privacy and AI (now Facebook AI Research London)
7. H. Jiang (PhD Liverpool, 2020), Cardiac segmentation (now Lecturer Xi'an Jiaotong-Liverpool University)
8. V. Giuffrida (PhD IMT, 2018), Deep learning in computer vision (now Asst Prof at University of Nottingham)
9. T. Joyce (PhD UoE 2016), Deep learning in cardiac MRI (now PostDoc at ETH Zurich)
10. M. Minervini (PhD IMT 2016), Joint classification and data compression (now Entrepreneur)

11. A. Mukhopadhyay (PhD USA 2014), Cardiac MR segmentation (now Junior Research Group Leader, Assistant Professor, TU Darmstadt, Germany)
12. M. Bevilacqua (PhD France 2014), Dictionary learning (Data Scientist, Cdiscount France)
13. 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]** (now at Nottingham)
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 in 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. 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 – 3/24
    Canon Medical / Royal Academy of Engineering Research Chair in Healthcare AI
2. EPSRC (EP/X017680/1) (**PI**)
    [£250,000]
    10/2022 – 09/2024
    From trivial representations to learning concepts in AI by exploiting unique data
3. EPSRC (EP/X033686/1) (**School of Engineering PI***, PI: Shu, Strathclyde*)
    [£625,005 for School of Engineering; £4,900,000 total]
    3/23-02/27
    Real-time Digital Twin Assisted Surgery
4. *BBSRC (***School of Engineering PI***, PI: Pridmore, Nottingham) [£2,400,000]*
    2/23-1/25
    PhenomUK Research Infrastructure
5. *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
6. 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)
7. EPSRC-Dstl (EP/S000631/1) (**co-I;** Overall PI: Davies, UoE)
    [Total £4,092,206 ScE]
    07/18-06/23
    University Defense Research Collaboration [UDRC] 3: Signal Processing in the Information Age

Completed:
1. 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]
2. 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
3. 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
4. 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
5. 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
6. 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
7. 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

8. 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
9. 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
10. CCITT – US Department of Transportation (USA) (**PI**; co-I: Katsaggelos)
    [Total £79,000]
    4/09-8/10
    iTRAC: Intelligent Compression of Traffic Video
11. 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
12. 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"
13. 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

TEACHING (Undergraduate**; G**raduate**)**

- **University of Edinburgh (UoE, UK):**
  Lecturer, 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 of the Computer, Decision,   *Academic years 2012-2014*
      and Systems Science / CDSS track – G
  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 2019/2020*

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. M. Jegorova, C. Kaul, C. Mayor, A.Q. O'Neil, A. Weir, R. Murray-Smith, S.A. Tsaftaris, "Survey: Leakage and Privacy at Inference Time", *IEEE Transactions on Pattern Recognition and Machine Intelligence*, in press, 2023 [preprint] [IF:24.31]

2. H.F. Williamson, J. Brettschneider, M. Caccamo, R.P. Davey, C. Goble, P.J. Kersey, S. May, R.J. Morris, R. Ostler, T. Pridmore, C. Rawlings, D. Studholme, S.A. Tsaftaris, S. Leonelli, "Data management challenges for artificial intelligence in plant and agricultural research [version 2; peer review: 2 approved]", *F1000Research*, vol. 10, no. 324, 2023 [preprint]

3. T. Xia, P. Sanchez, C. Qin, S.A. Tsaftaris, "Adversarial Counterfactual Augmentation: Application in Alzheimer's Disease Classification," *Frontiers in Radiology, Sec. Artificial Intelligence in Radiology*, 2022. [Full text]

4. B. Nichyporuk, J. Cardinelli, J. Szeto, R. Mehta, J.-P. R. Fallet, D.L. Arnold, S.A. Tsaftaris, T. Arbel, "Rethinking Generalization: The Impact of Annotation Style on Medical Image Segmentation," *Machine Learning In Biomedical Imaging (MELBA)*, 2022 [preprint]

5. V. Campello, T. Xia, X. Liu, P. Sanchez, C. Martin-Isla, S.E. Petersen, S. Segu, S.A. Tsaftaris, K. Lekadir, "Cardiac aging synthesis from cross-sectional data with cGANs," *Frontiers in Cardiovascular Medicine, Sec. Cardiovascular Imaging,* Sept. 2022. [Full text]

6. P. Sanchez, J.P. Voisey, T. Xia, H.I. Watson, A.Q. ONeil, S.A. Tsaftaris, "Causal Machine Learning for Healthcare and Precision Medicine", *Royal Society Open Science*, Aug 2022 [preprint] [Full text]

7. X. Liu, P. Sanchez, S. Thermos, A.Q. O'Neil, S.A. Tsaftaris, "Learning Disentangled Representations in the Imaging Domain," Medical Image Analysis, Vol. 80: 102516, 2022 [preprint][Accompanying webpage][Full text][IF: 13.08]

8. G. Valvano, A. Leo, S.A. Tsaftaris, "Re-using Adversarial Mask Discriminators for Test-time Training under Distribution Shifts," *Machine Learning In Biomedical Imaging (MELBA)*, 2022 [preprint] [Full text]

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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]