

Curriculum vitae

Education

1998-2001 – University of Padua, Italy – Department of Electronics & Informatics: **Ph.D. in Industrial Electronics and Informatics**
 1991-1997 – University of Padua: **Laurea Degree summa cum laude in Computer Engineering**

Career

2016-now – **Professor of Artificial Intelligence**, School of Engineering, Computing & Mathematics, **Oxford Brookes University**
 2008-now – Oxford Brookes University, Department of Computing and Communication Technologies
Head of Artificial Intelligence and Vision Research Group (2012-present); **Reader** (September 2011-December 2015); **Senior Lecturer** (July 2011-September 2011); **Lecturer and Early Career Fellow** (September 2008-July 2011)
 2006-2008 – INRIA Rhône-Alpes - *Institut National de Recherche en Informatique et en Automatique*: **Marie Curie fellow**
 2004-2006 – University of California at Los Angeles, Computer Science Department: **Postdoctoral researcher**, UCLA Vision Lab
 2003-2004 – Politecnico di Milano, Department of Electronics and Information Theory: **Fixed-term Assistant Professor**
 2001-2003 – University of Padua, Department of Electronics & Computer Science: **Postdoctoral researcher**
 2000 – Washington University in St Louis, Electronic Systems and Signals Research Laboratory (ESSRL): **Visiting scholar**

Other significant job offers and interviews: Huawei (**Chief AI Expert**, Cambridge; offer not accepted for personal reasons); **Cortexica** (Principal Scientist); **Samsung** (Head of new Cambridge research centre); **Amazon Go** (Jan-Feb 2017); **Toyota Research Institute** (TRI), Jan 2016; DAQRI, Dec 2015; **Apple Inc** - Special Projects, Jan 2015; Short-listed for a faculty position by **Robert Gordon University**, June 2008; **Ranked second in the 2007 Senior Researcher (CR1)** recruitment at INRIA Rennes, May 2007; Offered a four-year Ramon y Cajal fellowship by: **Universitat Pompeu Fabra**, Barcelona, May 2006; Offered postdoctoral jobs by: the **Georgia Institute of Technology**; the University of California at San Diego; the University of Houston, June 2006; interviewed by **Oxford University** for a postdoc position with the Machine Learning group (Prof.Roberts).

Research Interests

As the founder and head of Brookes' Artificial Intelligence and Vision research group, I have been conducting work at the current boundaries of **human action recognition**. My group has built in just a few years a leadership position in the field of deep learning for real-time action detection, localisation and recognition, which has led to be best detection accuracies to date and the only system able to localise multiple actions on the image plane in (better than) real time. We are now shifting towards work at the current boundaries of visual AI, such as: (i) the design of new deep learning architecture able to regress whole action tubes in real time; (ii) structured-output DNs with as output part-based discriminative models, (iii) deep neural video captioning incorporating attention models and prior logical knowledge, & (iv) the creation of a theory of mind for visual AIs. In the past I have proposed spectral embedding techniques for unsupervised 3D segmentation and matching which have been rather highly cited in the field (see Google metrics). The group has heavily invested in action and activity recognition via discriminative part-based models, in partnership with Oxford's Torr Vision group, generating an IJCV paper and prizes at MLVR and BMVC, and published results on metric learning for generative dynamical models (cfr. PAMI 2014 article).

I am a recognised leader in the field of **uncertainty theory and belief functions**. My reputation comes from the formulation of a geometric approach to uncertainty in which probabilities, possibilities, belief measures and random sets are represented and analysed by geometric means. This work is going to be published as a Springer monograph "The geometry of uncertainty" in 2018, and was published as a separate monograph by Lambert in 2014. My work concerns all the mathematical properties of non-additive probabilities and their application to decision making under partial or missing data, including: the generalisation of the law of total probability, the notions of upper and lower likelihoods, and that of generalised random variables.

Within **machine learning** my work is directed at understanding the mathematics of deep learning, providing new robust foundations for statistical learning theory, and developing novel tools based on the theory of random sets, in particular generalisation of the logistic regression frameworks and of max-entropy classifiers. I also worked on manifold learning for generative dynamical models, and the generalization of bilinear classifiers to the tensorial case in order to model multiple nuisance factors (see EPSRC First Grant). I am part of research consortia which aim at applying machine learning to human-robot interaction (the creation of emotional avatars), factory robotics (the coordination of fleets of automated forklifts), surgical robotics (robotic assistant surgeon arms) and healthcare (home monitoring and the early diagnosis of dementia from accelerometer and video data captured via wearable devices, cfr. a recent EPSRC bid and a joint G&P paper with Prof Dawes).

Research collaborations

Within the Department I am working very closely with the **Cognitive Robotics group** led by Nigel Crook, who is second supervisor for my PhD students, and Co-Investigator in the AVATAR project. Within Oxford University I collaborate with the **groups led by Phil Torr (Dept of Engineering) and Thomas Lukasiewicz (Dept of Computer Science)**, on both grant bids and paper writing. **I am part of three separate Horizon 2020 consortia** with bids in the making: a recently successful one led by Verona on surgical robotics (SARAS), one led by KTH Sweden on big data harvesting (SMADA), and one led by Ocado on factory robotics (NoHands). I am also participating in the setting up of a European Network of Excellence (COST action) in uncertainty theory. I collaborate with U. Malta on the AVATAR project on humanoid robots which can EEG-read human emotions and express them using postures, gestures and facial expressions. I have an ongoing strong link with the **Department of Statistics of Harvard University** (Arthur Dempster, Xiao-Li Meng) in virtue of my work on random set theory. I have been publishing joint papers with INRIA, University of Milan, Oxford University, Harvard, Renmin University of China.

I also maintain strong links with the **Department of Math Sciences at Durham University** (Dr Matthias Troffaes and Professor Frank Coolen), Professor Jonathan Lawry HoD of Bristol University's Engineering Mathematics, INRIA Rhone-Alpes's Radu Horaud, Professor Thierry Denoeux at Université de Technologie de Compiègne, Oxford University's Director of the Environmental Change Institute Jim Hall, Professor Lourdes Agapito at University College London, and many others.

Leadership and supervision

Still an associate member of the Torr Vision Group (TVG) led by Oxford Professor Philip Torr, I have been the **founder and head of the Artificial Intelligence and Vision research group** within the School of Engineering, Computing and Mathematics. As of 2018 the group is projected to comprise around 18-20 people, including 4 faculty members (Head of School Chrisina Jaynes, Principal Lecturer Faye Mitchell & Senior Lecturer Tjeerd Olde-Scheper) and 14 collaborators: 4 postdocs, a KTP associate, 2 Ph.D. students, 4 visiting students, an MSc student and 2 associate ones. Prof Nigel Crook and Senior Lecturer Matthias Rolf, from the Cognitive Robotics group, are also closely affiliated with the team. Close associate members also include Professor Philip Torr and Professor Thomas Lukasiewicz (Oxford University), Professor Helen Dawes (Oxford Brookes' movement science group), Dr Fridolin Wild (head of the Performance Augmentation Lab), among others. Several former students of mine are now postdocs in world class universities. A list of past and present group members can be found below.

Postdoctoral researchers (6): Three candidates to be enrolled (Feb 2018-2020), SARAS Horizon 2020 project; **Ruomei Yan** (Sept 2017 - now), project title "Deep neural video captioning"; **Ahmed Samet** (April - July 2017), Project title: "New robust foundations of statistical machine learning"; **Wenjuan Gong** (Feb 2013 - Jan 2014), funded by EPSRC First Grant, Project title: "Tensorial modeling of dynamical systems for gait and activity recognition" (now Lecturer at China University of Petroleum, Qingdao, Shandong, China).

KTP Associates (1): Ruomei Yan (Sept 2015 – Aug 2017), funded by Meta Vision KTP, Project title: "Sensing a good weld: new applications in computer vision" (formerly a Lecturer at Shanghai Chan-Mai University, the 3rd best Chinese university).

Ph.D. students (5): (as Director of Studies, unless otherwise indicated): **Michael Sapienza** (Oct 2011 - Oct 2014), Thesis title: "Recognising and localising human actions" (now with Samsung Research, formerly postdoc at Oxford University, Department of Engineering Science); **Vinhav Vineet** (January 2014 - October 2014), second supervisor, thesis title: "Recognition, Reorganisation, Reconstruction and Reinteraction for Scene Understanding" (now postdoc at Stanford University); **Min Han Lee** (September 2014 - August 2015), Topic: "Action recognition from unconstrained videos"; **Suman Saha** (September 2014 - present), Topic: "Uncertainty in Computer Vision", Winner of best MSc dissertation at University of Bedfordshire and best reading group competition at the 2015 International Summer School of Computer Vision (ICVSS 2015); **Gurkirt Singh** (September 2015 - present), Topic: "Real-time Action Recognition for Human-Robot Interaction", currently intern at Disney Research, CMU.

Visiting students (9): Rocco de Rosa (January 2014 - July 2014), EU Erasmus Training Programme (now Data Science Manager at Rank Group, formerly a postdoc at University of Rome "La Sapienza"); **Serdar Buyukkanli** (June 2014 - September 2014), funded by EU Erasmus Training Programme; **Brenda Romino** (February 2016 - August 2016), funded by University of Naples; **Manuele Di Maio** (March 2017 - September 2017), funded by Erasmus+; **Andrea Morelli** (January 2017 - May 2017), funded by Erasmus+; **Shashwat Shukla** (May-Jul 2017), Oxford Brookes - IIT Bombay exchange programme; **Santanu Rathod** (May-Jul 2018), Oxford Brookes - IIT Bombay exchange programme; **Valentina Fontana** (Mar-Sep 2018), Erasmus+ exchange with Naples' Federico II; **Giacomo De Rossi** (Sep-Nov 2018), SARAS.

MSc students (11): Brad Lishman (2012), Stephane Bourgeois (2014), Jonathan Pound (2014), Paula Rocafull (2015), Ben Guy (2016), Kurt DeGiorgio (2016), Misbah Munir (2016-17), Stavros Gasparis (2017), K. Parshotam (2017), Stephen Akkrigg (2018), Francis Kaping'A (2018).

External examiner: I was **external examiner** for Ph.D. candidate Andrea Argentini, University of Trento, Italy in 2012 (title of the thesis: “Ranking Aggregation Based on Belief Function Theory”). I currently am external examiner for Zhenghua Xu, Department of Computer Science, Oxford University, Timber Kerkvliet, VU University Amsterdam, and John Klein (Lille University, France). I have been **internal examiner** for Ph.D. candidates Chris Russell (title: “Higher-order inference for vision problems”) and Paul Sturges (April 2016).

Awards

2017 CVPR Charades challenge, 2nd place (with student G. Singh) http://vuchallenge.org/charades.html (1st place won by Google Deepmind’s TeamKinetics)	Jun 2017
2016 CVPR ActivityNet action detection challenge, 2nd place (with student G. Singh)	Jun 2016
Next 10 Award - Oxford Brookes University - Faculty of Technology Research accelerator programme, awarded to the top emerging researchers in the Faculty	Oct 2012
Outstanding Reviewer Award - British Machine Vision Conference (BMVC 2012)	Sep 2012
<i>Short-listed for the Best Paper Award</i> - British Machine Vision Conference (BMVC 2012) for the paper: “Learning discriminative space-time actions from weakly labelled videos”	Sep 2012
Best Poster Prize - INRIA Visual Recognition and Machine Learning Summer School (VRML 2012) for the poster: “Learning discriminative space-time actions from weakly labelled videos”	July 2012
Best Poster Award - International Symposium on Imprecise Probabilities Theories and Applications (ISIPTA’11) for the poster: “Geometric conditional belief functions in the belief space”	July 2011
<i>Short-listed for the Best Paper Award</i> - ECSQARU 2011 for the paper “On consistent approximations of belief functions in the mass space”	Jun 2011
Best Paper Award - Pacific Rim International Conference on Artificial Intelligence (PRICA’08) for the paper: “Alternative formulations of the theory of evidence based on basic plausibility & commonality assignments	Dec 2008
Marie Curie fellowship	Sep 2006

In addition, my PhD student Suman Saha won the **reading group prize at ICVSS 2015**, the International Computer Vision Summer School. My MSc student Misbah Munir has won in February 2017 the **OBSEA (the Oxford Brookes Social Entrepreneur Awards)** Try It Award to fund a proof of concept of her work on deep learning for video captioning.

Esteem indicators

Conference chairing: I was the **General Chair and local organizer of the 3rd International Conference on the Theory of Belief Functions (BELIEF 2014)**, held in St. Hugh’s college, Oxford, UK, September 26-28 2014. I am in the **Steering Committee of SMPs 2018/BELIEF 2018**, Université de Technologie de Compiègne, 17-21 September, 2018.

Editorships: I was Associate Editor of the IEEE Transactions on Fuzzy Systems (2013 - 2017), **the top journal in Computer Science with a 2015 impact factor of 8.746**, and of the IEEE Transactions on Systems, Man, and Cybernetics C (January 2011 - March 2013). I was also Guest Editor of Elsevier’s International Journal of Approximate Reasoning (October 2014 - present), Guest Editor of Elsevier’s Information Fusion (2009-12).

Societies: As a three-term member of the **Board of Directors of the Belief Functions and Applications Society (BFAS)** I am involved in the organisation of that series of international conferences. Since 2017 I am also **Executive Editor of the Society for Imprecise Probabilities – Theory and Applications (SIPTA)**.

Conference program committees: I have served in the **Technical Program Committee and Senior PC of some 80 international conferences**, including: **IJCAI 2016-2018, ECAI 2018** - the top conference in Artificial Intelligence; **NIPS 2018** (the top machine learning venue); **UAI 2014-2018** - **Senior Program Committee** member (Area Chair) of Uncertainty in Artificial Intelligence; **BMVC 2009-2018** - **Area Chair** for the British Machine Vision Conference; **IEEE CVPR (Computer Vision and Pattern Recognition)**; **SMC 2013-2018** - the IEEE International Conference on Systems, Man, and Cybernetics. Others include **FUSION 2017-18** - the International Conference on Information Fusion, **IPMU 2014-2018** - the Information Processing and Management of Uncertainty series of conferences; **ACCV 2014, 2018** - The Asian Conference of Computer Vision; **VISAPP 2006-2018** - International Conference on Computer Vision Theory and Applications. For a full list check my web site.

Grant panel review: I am a Reviewer for the **European Research Council (ERC)**, Consolidator Grants (CoG), the Italian Ministry of Scientific Research, and I am **Member of the Associate College of reviewers for EPSRC**.

Invited talks and keynotes: I have been invited to give seminars in a host of national and international institutions, including **Oxford University’s** Department of Engineering (Feb 13 2018), **Harvard University’s** Department of Statistics (July 14 2016),

Cambridge University's Department of Engineering (March 2016), **Microsoft Research Europe** (2006), **GeorgiaTech** (2006), Pompeu Fabra University (2006), **EPFL-IDIAP** (2006), **MIT** (1999).

In 2015 I was invited by the **Oxford Martin School** to join a select group of Oxford Academics to meet with former World Chess Champion Garry Kasparov and discuss some of the future challenges of AI. I was invited again in March 2017.

In the last couple of years I was invited as **keynote speaker** to a number of events:

- the CSA 2016 international conference (Algiers, Dec 2016);
- the 2017 BMW Knowledge Day (February 2017);
- the 4th Summer School on Belief Functions (Xian, China, July 2017);
- the Roadmap to autonomous surgery Workshop, Verona, Italy, Oct 31 2017;
- the Winter session of the Oxford Prospects Programme (St Cross college, Oxford, Jan 31 2018);
- the Ambassadors' Roundtable on AI organised by the Anglo-Israel Association (Royal Society, London, Feb 27 2018);
- the Fifth Bayesian, Fiducial and Frequentist Workshop (BFF5), Ann Arbor, USA, May 6-9 2018;
- the 2nd Biennial Summer School on Surgical Robotics (COSUR 2018), Verona, Italy, July 10 2018.

I was also invited to give a tutorial on belief functions and uncertainty theory by the **Department of Statistics of Seoul National University** and the **Department of Mathematics of Yonsei University** (May 30 - June 1 2018).

Organisation of Tutorials and Special Issues:

- Belief functions for the working scientist, **Half-day tutorial @ IJCAI-16**
- Belief functions for the working scientist, **Tutorial @ Uncertainty in Artificial Intelligence (UAI) 2015**
- **Special Issue:** Selected papers from BELIEF 2014, International Journal of Approximate Reasoning, 2015-16
- **Special Issue:** Information Fusion Applications to Human Health and Safety, Information Fusion, Elsevier, Volume 13, Issue 2, 2012; Co-editors: Paul Snow and Al Ozonoff (Harvard University)

Media impact:

- Article: **Walk this way**, "International Innovation", a Research Media magazine, January 2014
- "Towards machines that can read your mind", Professorial Lecture, Jan 24 2018
<https://www.facebook.com/oxfordbrookes/videos/10156698398637908/> (**3200 views on Facebook**)
- UAI 2015 tutorial: <https://www.youtube.com/watch?v=nhGznOR5TgM> (**1845 views on YouTube**)
- Harvard Statistics colloquia invited talk: Belief functions: past, present and future
<https://www.youtube.com/watch?v=I9XKJKgkURQ> (**1367 views on YouTube**)
- **Risk Group LLC:** invited podcast on "Advances in Artificial Intelligence: Gesture and Action Recognition"
<https://www.youtube.com/watch?v=xWrUwJAYqA0&t=1258s> (167 views)

Publications Metrics

My papers have given a major contribution to the Department of Computing's REF 2014 results. In all mock panels **they have consistently scored 4*** (consider that 18% outputs have eventually been judged 4*, and only 9 members of staff submitted):

- A geometric approach to the theory of evidence 4*
- Geometry of relative plausibility and relative belief of singletons 4*
- Credal semantics of Bayesian transformations in terms of probability intervals 4*
- The geometry of consonant belief functions: simplicial complexes of necessity measures 4*

Google Scholar citations: Total citations: **1218 (+179 in 2017)**, **H-index: 18**, **i10-index: 36**.

Top papers by Scholar citation count:

1. Articulated Shape Matching Using Laplacian Eigenfunctions and Unsupervised Point Registration ('08) 187
2. A geometric approach to the theory of evidence (2008) 134
3. Two New Bayesian Approximations of Belief Functions Based on Convex Geometry 63

Semantic Scholar citations: **1,071-2,020** citations, **72 highly influential**, citation velocity **118 per year**. Top papers:

1. Articulated Shape Matching Using Laplacian Eigenfunctions and Unsupervised Point Registration 236
2. A geometric approach to the theory of evidence 130
3. Two New Bayesian Approximations of Belief Functions Based on Convex Geometry 80
4. Deep learning for detecting multiple space-time action tubes in videos 58

Academia.edu: 5,048 total views (top 4%)

Publications

To date I am the author of **104 peer-reviewed publications**, published or under review, including two monographs, one edited volume, three book chapters, 21 journal papers (+ several more under review or revision), 9 chapters in book series.

Most of my articles are on **very high impact journals (IEEE TFS, PAMI, IJCV, IEEE SMCB)**.

The total impact factor of my journal papers is 88.634.

Monographs and edited volumes

1. F. Cuzzolin, *Visions of a generalised probability theory*, Lambert Academic Publishing, Sep 2014 ISBN-13: 978-3-659-13175-2
2. F. Cuzzolin, *The geometry of uncertainty – The geometry of imprecise probabilities*, Artificial Intelligence: Foundations, Theory and Algorithms, Springer (to appear in 2018)
3. F. Cuzzolin (Editor), *Belief Functions: Theory and Applications*, Lecture Notes in Artificial Intelligence 8764, Springer, 2014
4. F. Cuzzolin, S. Destercke, T. Denoeux, A. Martin (Editors), *Belief Functions: Theory and Applications - Proceedings of the 5th International Conference on Belief Functions*, Springer, 2018 (upcoming)

Book Chapters

5. F. Cuzzolin, *An algebraic study of the notion of independence of frames*, Chapter 12, "Mathematics of Uncertainty Modeling in the Analysis of Engineering and Science Problems", IGI Publishing, January 2014
6. F. Cuzzolin, *Manifold learning for multi-dimensional auto-regressive dynamical models*, in "Machine Learning for Vision-based Motion Analysis", Advances in Pattern Recognition 1, 55-74, Springer, 2011
7. F. Cuzzolin, *Multilinear modeling for robust identity recognition from gait*, in "Behavioral Biometrics for Human Identification: Intelligent Applications", 169-188, Liang Wang and Xin Geng (Eds.), IGI, 2010

Journal articles

8. R. de Rosa, I. Gori, N. Cesa-Bianchi & F. Cuzzolin, *Active Incremental Recognition of Human Activities in a Streaming Context*, Pattern Recognition Letters 99, pp. 48-56, November 2017 (IF 1.995)
9. Fabio Cuzzolin, Michael Sapienza, Patrick Esser, Helen Dawes, Suman Saha, Johnny Collett and Marloes Franssen, *Metric learning for Parkinsonian identification from IMU gait measurements*, Gait and Posture 54, pp. 127-132, May 2017 (IF 2.347)
10. W. Gong & F. Cuzzolin, *A belief-theoretical approach to example-based pose estimation*, **IEEE Fuzzy Systems**, online March 23 2017, DOI: 10.1109/TFUZZ.2017.2686803 (**IF 7.671**)
11. G. Mellema and F. Cuzzolin, *ISIF Sponsored Workshop - BELIEF 2014*, ISIF Perspectives on Information Fusion, 2016
12. F. Cuzzolin, *Belief functions: Theory and applications (BELIEF 2014)*, Int. J. Approx. Reason. (I.F. 2. 846), 2016.
13. F. Cuzzolin, D. Mateus & R. Horaud, *Robust coherent Laplacian protrusion segmentation along 3D sequences*, **International Journal of Computer Vision** 112(1), pp. 43-70, March 2015 (**IF 8.222**)
14. A. Antonucci, R. de Rosa, A. Giusti & Fabio Cuzzolin, *Robust Classification of Multivariate Time Series by Imprecise Hidden Markov Models*, International Journal of Approximate Reasoning 56, Part B, pp. 249-263, January 2015 (I.F. 2. 846)
15. M. Sapienza, F. Cuzzolin & P. Torr, *Learning discriminative space-time action parts from weakly labelled videos*, **International Journal of Computer Vision** 110(1), pp. 30-47, Oct 2014 (**IF 8.222**)
16. F. Cuzzolin and M. Sapienza, *Learning pullback HMM distances*, **IEEE PAMI** 36(7), pp. 1483-1489, July 2014 (**IF 8.33**)
17. F. Cuzzolin, *On the fiber bundle structure of the space of belief functions*, Ann. Combinatorics 18(2), 245-263, June 2014
18. F. Cuzzolin, *Lp consonant approximations of belief functions*, **IEEE Fuzzy Systems** 22(2), pp. 420-436, April 2014 (**IF 7.671**)
19. F. Cuzzolin, *On the relative belief transform*, Int. Journal of Approximate Reasoning 53(5), 786-804, 2012 (I.F. 2. 846)
20. Al Ozonoff, Fabio Cuzzolin and Paul Snow, *Guest editorial: Special issue on information fusion applications to human health and safety*, **Information Fusion** 13(2), April 2012 (**IF 5.667**)
21. F. Cuzzolin, *Three alternative combinatorial formulations of the theory of evidence*, Intelligent Data Analysis 14(4), pp. 439-464, December 2010 (**best paper award at PRICAI'08**)
22. F. Cuzzolin, *Geometry of relative plausibility and relative belief of singletons*, Ann Math Artif Intel 59(1), 47-79, May 2010
23. F. Cuzzolin, *The geometry of consonant belief functions: simplicial complexes of necessity measures*, Fuzzy Sets and Systems 161(10), 1459-1479, 16 May 2010 (I.F. 2.718)
24. F. Cuzzolin, *Credal semantics of Bayesian transformations in terms of probability intervals*, **IEEE Tr. Systems, Man, and Cybernetics - part B** 40(2), 421-432, 2010 (**IF 7.384**)
25. F. Cuzzolin, *A geometric approach to the theory of evidence*, IEEE Tr. SMC - part C 38(4), pp. 522-534, 2008 (I.F. 2.171)
26. F. Cuzzolin, *Two new Bayesian approximations of belief functions based on convex geometry*, **IEEE Tr. Systems, Man, and Cybernetics - part B** 37(4), pp. 993-1008, 2007 (**IF 7.384**)
27. F. Cuzzolin, *Algebraic structure of the families of compatible frames of discernment*, Ann Math Artif Intel 45, 241-274, 2005

28. F. Cuzzolin, *Geometry of Dempster's rule of combination*, **IEEE Tr. SMC - part B** 34(2), 961- 977, 2004 (**IF 7.384**)

Under review or revision

29. Giacomo De Rossi, Nicola Piccinelli, Fabio Cuzzolin and Riccardo Muradore, Optimized Upsampled Convolutional Networks for Segmentation of Surgical Gestures, submitted to the International Journal of Computer Vision (IJCV), Special Issue on Deep Learning for Robotic Vision, June 2018 (**IF 8.222**)
30. S. Saha, G. Singh & F. Cuzzolin, Action Tube Regression with Tube Proposal Networks, submitted to IEEE PAMI (**IF 8.33**)
31. Andrea Argentini, Enrico Blanzieri & Fabio Cuzzolin, Ranking Estimation with Belief Functions, subm. IEEE TKDE, to revise and submit to IEEE Transactions on Cybernetics (**I.F. 6.22**)
32. Fabio Cuzzolin and Sebastien Destercke, Betting with probability intervals: the intersection probability, submitted to Artificial Intelligence (I.F. 3.333), February 2007, revised June 2009, tIno revise 2018
33. Fabio Cuzzolin, Geometric conditioning in belief calculus, submitted to Artificial Intelligence (I.F. 3.333), March 2011, to revise 2018
34. Fabio Cuzzolin, Consistent transformations of belief functions, submitted to IJAR, to revise and resubmit to Information Sciences (I.F. 3.364), to revise 2018
35. Thomas Burger and Fabio Cuzzolin, Two k-additive generalizations of the pignistic transform for imprecise decision making, submitted to Fuzzy Sets and Systems (I.F. 2.138), October 2011, to revise 2018

In preparation

- F. Cuzzolin, Fifty years of belief functions, to submit to the International Journal of Approximate Reasoning (I.F. 2. 846)
- F. Cuzzolin, Uncertainty theories: A bird's eye view, to submit to IEEE Fuzzy Systems (**IF 7.671**)
- C. Liu and F. Cuzzolin, Total belief theorem, to submit to the International Journal of Approximate Reasoning (I.F. 2. 846)
- F. Cuzzolin, Generalised logistic regression, to submit to the Journal of the Royal Statistical Society B (**IF 4.61**)
- F. Cuzzolin, Generalised maximum entropy classification, to submit to IEEE PAMI (**IF 8.33**)
- F. Cuzzolin, Statistical inference with random set likelihood functions, to submit to the Journal of the Royal Stat Society B (**IF 4.61**)

Chapters in book series

36. Fabio Cuzzolin, Complexes of outer consonant approximations, in "Symbolic and Quantitative Approaches to Reasoning with Uncertainty", Lecture Notes in Computer Science, Vol. 5590/2009, pp. 275-286
37. Fabio Cuzzolin, The intersection probability and its properties, in "Symbolic and Quantitative Approaches to Reasoning with Uncertainty" (ECSQARU'09), LNCS Vol. 5590/2009, pp. 287-298, Springer, 2009
38. Fabio Cuzzolin, Alternative formulations of the theory of evidence based on basic plausibility and commonality assignments (**long paper, best paper award recipient**), in "PRICAI 2008: Trends in Artificial Intelligence", Lecture Notes in Computer Science, Vol. 5351/2008, pp. 91-102, Springer, 2009
39. Fabio Cuzzolin, Dual properties of the relative belief of singletons (**long paper**), in "PRICAI 2008: Trends in Artificial Intelligence", LNCS Vol. 5351/2008, pp. 78-90, Springer Berlin/Heidelberg, 2009
40. Fabio Cuzzolin, On the credal structure of consistent probabilities, in "Logics in Artificial Intelligence", Lecture Notes in Computer Science, Volume 5293/2008, pp. 126-139, Springer Berlin / Heidelberg, 2008
41. Fabio Cuzzolin, A lattice-theoretic interpretation of independence on frames, in "Interval/ Probabilistic Uncertainty and Non-classical Logics", Advances in Soft Computing, Vol. 46, Springer-Verlag, 2008
42. Fabio Cuzzolin, Semantics of the relative belief of singletons, in "Interval/Probabilistic Uncertainty and Nonclassical Logics", Advances in Soft Computing, Vol. 46, Springer-Verlag, Berlin - Heidelberg, 2008
43. Fabio Cuzzolin, Diana Mateus, Edmond Boyer & Radu Horaud, Robust spectral 3D-bodypart segmentation in time, Lecture Notes in Computer Science, Vol. 4814/2007, pp. 196-211, Springer, 2007
44. Fabio Cuzzolin, On the orthogonal projection of a belief function, in "Symbolic and Quantitative Approaches to Reasoning with Uncertainty", LNCS Vol. 4724/2007, pp. 356-367, Springer, 2007

Peer-reviewed conference proceedings

Published

45. F. Cuzzolin, Generalised maximum entropy classifiers, accepted by BELIEF 2018
46. F. Cuzzolin, General geometry of belief function combination, accepted by BELIEF 2018
47. G. Singh, S. Saha, M. Sapienza, P. Torr & F. Cuzzolin, Online Real-time Multiple Spatiotemporal Action Localisation and Prediction, accepted by **ICCV 2017**, Venice, Italy, October 2017 (**poster**)

48. S. Saha, G. Singh & F. Cuzzolin, AMTnet: Action-Micro-Tube regression by end-to-end trainable deep architecture, accepted by **ICCV 2017**, Venice, Italy, October 2017 (**poster**)
49. Chunlai Zhou and Fabio Cuzzolin, The total belief theorem, **Uncertainty in Artificial Intelligence (UAI)**, 2017 (**poster**)
50. Suman Saha, Gurkirt Singh, Michael Sapienza, Philip Torr and Fabio Cuzzolin, Deep Learning for Detecting Multiple Space-Time Action Tubes in Videos, **BMVC 2016** (**poster**)
51. Cristian Roman, Michael Sapienza, Peter Ball, Shumao Ou, Fabio Cuzzolin and Philip Torr, Heterogeneous Wireless System Testbed for Remote Image Processing in Automated Vehicles, **IEEE CSNDSP 2016**
52. Saumya Jetley and Fabio Cuzzolin, 3D activity recognition using gradient analysis consolidated over motion history and binary shape templates, **Asian Conference of Computer Vision (ACCV 2014) - Human Gait and Action Analysis in the Wild: Challenges and Applications**, Singapore, Nov 2014
53. Rocco de Rosa, Ilaria Gori, Nicolo' Cesa Bianchi and Fabio Cuzzolin, Online action recognition via nonparametric incremental learning, **Proc. of the British Machine Vision Conference (BMVC'14)**, 2014
54. Wenjuan Gong, Michael Sapienza and Fabio Cuzzolin, Fisher tensor decomposition for unconstrained gait identification, **ECML-PKDD Workshop on "Tensor Methods for Machine Learning"**, July 2013
55. Fabio Cuzzolin and Wenjuan Gong, Belief Modeling Regression for pose estimation, **Proceedings of the 16th IEEE International Conference on Information Fusion (FUSION'13)**, pp. 1398-1405, Istanbul, July 2013
56. Rocco de Rosa, Alessandro Antonucci, Alessandro Giusti and Fabio Cuzzolin, Classification of Temporal Data by Imprecise Dynamic Models, **International Symposium on Imprecise Probabilities and Their Applications (ISIPTA 2013)**, Compiègne, France, July 2013
57. Michael Sapienza, Fabio Cuzzolin and Philip Torr, Learning discriminative space-time actions from weakly labelled videos, **Proceedings of the British Machine Vision Conference (BMVC'12)**, University of Sussex, UK, September 2012 (**oral, shortlisted for major prizes**)
58. Fabio Cuzzolin, Consonant approximations in the belief space, **Proceedings of the 2nd International Conference on Belief Functions (BELIEF'12)**, Compiègne, France (**oral**)
59. Fabio Cuzzolin, Generalizations of the relative belief transform, **Proceedings of the 2nd International Conference on Belief Functions (BELIEF'12)**, Compiègne, France (**oral**)
60. Fabio Cuzzolin, Game-theoretical semantics of epistemic probability transformations, **Proc. of the 2nd International Conference on Belief Functions (BELIEF'12)**, Compiègne (**oral**)
61. Fabio Cuzzolin, Lp consonant approximations of belief functions in the mass space, **Proceedings of the International Symposium on Imprecise Probabilities and Their Applications (ISIPTA'11)**, Innsbruck, June 2011 (**shortlisted for best paper based on review scores**)
62. Fabio Cuzzolin, On consistent approximations of belief functions in the mass space, **Proceedings of ECSQARU'11**, Belfast, June 2011
63. Alessandro Antonucci and Fabio Cuzzolin, Credal Sets Approximation by Lower Probabilities: Application to Credal Networks, **Proceedings of the International Conference on Information Processing and Management of Uncertainty (IPMU'10)**, June 2010
64. Fabio Cuzzolin, Geometric conditioning of belief functions, **the First International Workshop on the Theory of Belief Functions (BELIEF 2010)**, Brest, April 2010
65. Thomas Burger and Fabio Cuzzolin, The barycenters of the k-additive dominating belief functions and the pignistic k-additive belief functions, **BELIEF 2010**, Brest, April 2010
66. Fabio Cuzzolin, Consistent approximations of belief functions, **Proceedings of the International Symposium on Imprecise Probabilities and Their Applications (ISIPTA'09)**, Durham, July 2009
67. Fabio Cuzzolin, Credal semantics of Bayesian approximations, **Proceedings of the International Symposium on Imprecise Probabilities and Their Applications (ISIPTA'09)**, Durham, UK, July 2009
68. Fabio Cuzzolin, Learning pullback metrics for linear models, **European Conference on Computer Vision (ECCV'08)**, First workshop on Machine Learning for Vision-based Motion Analysis, October 2008
69. Diana Mateus, Radu Horaud, David Knossow, Fabio Cuzzolin, and Edmond Boyer, Articulated Shape Matching Using Laplacian Eigenfunctions and Unsupervised Point Registration, **Proceedings of Computer Vision and Pattern Recognition (CVPR'08)**, Anchorage, Alaska, June 2008 (**acceptance rate 25%**)
70. Fabio Cuzzolin, Diana Mateus, David Knossow, Edmond Boyer, and Radu Horaud, Coherent Laplacian protrusion segmentation, **Proceedings of CVPR'08**, Anchorage, June 2008 (**acceptance rate 25%**)
71. Fabio Cuzzolin, Boolean and matroidal independence in uncertainty theory, **Proc. of the 10th International Symposium on Mathematics and Artificial Intelligence (ISAIM'08)**, Fort Lauderdale, January 2008
72. Fabio Cuzzolin, An interpretation of consistent belief functions in terms of simplicial complexes, **Proceedings of ISAIM'08**, Fort Lauderdale, Florida, January 2008

73. Diana Mateus, Fabio Cuzzolin, Edmond Boyer and Radu Horaud, Articulated Shape Matching by Robust Alignment of Their Embedded Representations, International Conference on Computer Vision (ICCV'07) - 3dRR Workshop, Rio de Janeiro, Brasil, October 20 2007
74. Diana Mateus, Fabio Cuzzolin, Edmond Boyer, and Radu Horaud, Articulated Shape Matching Using Locally Linear Embedding and Orthogonal Alignment, ICCV'07 - NTRL Workshop, Rio de Janeiro, October 14 2007
75. Fabio Cuzzolin, Using Bilinear Models for View-invariant Action and Identity Recognition, Proc. of the IEEE Int. Conf. on Computer Vision and Pattern Recognition (CVPR'06), pp. 1701-1708, New York, June 2006
76. Fabio Cuzzolin, The geometry of relative plausibilities, Proceedings of the 11th International Conference on Information Processing and Management of Uncertainty (IPMU'06), Paris, July 2006
77. Fabio Cuzzolin, On the properties of relative plausibilities, Proceedings of the International Conference of the IEEE Systems, Man, and Cybernetics Society (SMC'05), vol.1, pp. 594-599, Hawaii, USA - October 2005
78. Fabio Cuzzolin and Ruggero Frezza, Evidential modeling for pose estimation, Proc. of the 4th International Symposium on Imprecise Probabilities and Their Applications (ISIPTA'05), Pittsburgh, 2005
79. Giambattista Gennari, Alessandro Chiuso, Fabio Cuzzolin and Ruggero Frezza, Integration of shape constraints in data association filters, Proc. of IEEE CDC'04, vol.3, pp. 2668-2673, December 14-17, 2004
80. Fabio Cuzzolin, Augusto Sarti and Stefano Tubaro, Action modeling with volumetric data, Proc. of the 2004 International Conference on Image Processing (ICIP'04), vol. 2, pp. 881- 884, Singapore, October 2004
81. Fabio Cuzzolin, Augusto Sarti and Stefano Tubaro, Invariant action classification with volumetric data, International Workshop on Multimedia Signal Processing, pp. 395-398, Siena, Italy, 9/29-10/1 2004
82. Fabio Cuzzolin, Simplicial complexes of finite fuzzy sets, Proceedings of the International Conference on Information Processing and Management of Uncertainty (IPMU'04), pp. 1733-1740, Perugia, July 2004
83. Fabio Cuzzolin, Geometry of upper probabilities, Proceedings of the 3rd International Symposium on Imprecise Probabilities and Their Applications (ISIPTA'03), Lugano, Switzerland, July 14-17, 2003
84. Fabio Cuzzolin, Ruggero Frezza, Alessandro Bissacco and Stefano Soatto, Towards unsupervised detection of actions in clutter, Proceedings of the 2002 Asilomar Conference on Signals, Systems, and Computers, vol.1, pp. 463-467, Asilomar Conference Center Pacific Grove, CA, 2002
85. Giambattista Gennari, Alessandro Chiuso, Fabio Cuzzolin and Ruggero Frezza, Integrating shape and dynamic probabilistic models for data association and tracking, Proceedings of the IEEE 2002 Conference on Decision and Control (CDC'02), Las Vegas, Nevada, December 10-13, 2002
86. Fabio Cuzzolin, Geometry of Dempster's rule, Proceedings of the International Conference on Fuzzy Systems and Knowledge Discovery (FSKD'02), Singapore, November 18-22, 2002
87. Fabio Cuzzolin and Ruggero Frezza, Lattice structure of the families of compatible frames of discernment, Proceedings of ISIPTA'01, Ithaca, NY, June 26-29, 2001
88. Fabio Cuzzolin and Ruggero Frezza, Geometric analysis of belief space and conditional subspaces, Proceedings of ISIPTA'01, Ithaca, NY, June 26-29, 2001
89. Fabio Cuzzolin and Ruggero Frezza, Integrating feature spaces for object tracking, Proc. of International Symposium on the Mathematical Theory of Networks and Systems (MTNS2000), Perpignan, June 2000
90. Fabio Cuzzolin and Ruggero Frezza, An evidential reasoning framework for object tracking, SPIE - Photonics East 99 - Telemanipulator and Telepresence Technologies VI, vol. 3840, pp. 13-24, September 19-22, 1999
91. Andrea Sorrentino, Fabio Cuzzolin & Ruggero Frezza, Using hidden Markov models and dynamic size functions for gesture recognition, Proceedings of the 8th British Machine Vision Conference (BMVC'97) (Adrian Clark ed.), vol. 2, pp. 560-70, 1997

Under review

92. Fabio Cuzzolin, Statistical inference with belief functions: a survey, submitted to IJCAI-ECAI 2018, Survey Track
93. Fabio Cuzzolin, Uncertainty measures: state of the art, submitted to IJCAI-ECAI 2018, Survey Track
94. Fabio Cuzzolin, Belief likelihood function for generalised logistic regression, submitted to UAI 2018
95. Suman Saha, Gurkirt Singh & Fabio Cuzzolin, TraMNet - Transition Matrix Network for High-Performance Spatio-temporal Action Localisation, submitted to ECCV 2018
96. Harkirat Behl et al, Incremental tube construction for human action detection, submitted to BMVC 2018

Oral and poster conference presentations

97. Gurkirt Singh, Suman Saha, Michael Sapienza, Philip Torr and Fabio Cuzzolin, Deep Learning for Detecting Multiple Space-Time Action Tubes in Videos, ICVSS 2016
98. Suman Saha and Fabio Cuzzolin, Online human action localisation based on appearance and motion cues, International Computer Vision Summer School (ICVSS'15), July 2015

99. Michael Sapienza, Fabio Cuzzolin and Philip Torr, Learning discriminative space-time actions from weakly labelled videos (**poster prize recipient**), INRIA Machine Learning Summer School, Grenoble, July 2012
100. Fabio Cuzzolin, Geometric conditional belief functions in the belief space (**best poster award recipient**), Int. Symposium on Imprecise Probabilities and Their Applications (ISIPTA'11), Innsbruck, June 2011
101. Fabio Cuzzolin, On the relationship between the notions of independence in matroids, lattices, and Boolean algebras, 21th British Combinatorial Conference (BCC'07), Reading, UK, July 8-13, 2007
102. Fabio Cuzzolin, Lattice modularity and linear independence, 18th British Combinatorial Conference (BCC'01), University of Sussex, Brighton, UK, July 1-6, 2001
103. Fabio Cuzzolin, Families of compatible frames of discernment as semimodular lattices, International Conference of the Royal Statistical Society (RSS 2000), Reading, UK, Sept 2000
104. Fabio Cuzzolin and Ruggero Frezza, Combining qualitative and quantitative models for motion reconstruction of articulated objects, Mathematical Theory of Networks and Systems, Padua, July 1998

Technical reports and ArXiv

- Suman Saha, Gurkirt Singh, Michael Sapienza, Philip Torr and Fabio Cuzzolin, Spatio-temporal human action localisation and instance segmentation in temporally untrimmed videos, arXiv:1707.07213, July 22 2017
- Suman Saha, Gurkirt Singh, Fabio Cuzzolin, AMTnet: Action-Micro-Tube regression by end-to-end trainable deep architecture, arXiv:1704.04952 [cs.CV], April 17 2017
- Harkirat S. Behl, Michael Sapienza, Gurkirt Singh, Suman Saha, Fabio Cuzzolin, Philip H. S. Torr, Incremental Tube Construction for Human Action Detection, arXiv:1704.01358 [cs.CV], April 5 2017
- Gurkirt Singh, Suman Saha, Michael Sapienza, Philip Torr, Fabio Cuzzolin, Online Real-time Multiple Spatiotemporal Action Localisation and Prediction, arXiv:1611.08563 [cs.CV], November 25, 2016
- Suman Saha, Gurkirt Singh, Michael Sapienza, Philip Torr and Fabio Cuzzolin, Deep Learning for Detecting Multiple Space-Time Action Tubes in Videos, arXiv:1608.01529, August 4 2016
- Gurkirt Singh and Fabio Cuzzolin, Untrimmed Video Classification for Activity Detection: submission to ActivityNet Challenge, arXiv:1607.01979, July 7 2016
- Rocco de Rosa, Ilaria Gori, Nicolo' Cesa Bianchi, F. Cuzzolin & B. Caputo, Active Incremental Recognition of Human Activities from Streaming Videos, <http://arxiv.org/pdf/1604.02855v1.pdf>, April 12 2016
- Fabio Cuzzolin, Consistent transformations of belief functions, arXiv:1407.8151, 30 July 2014
- Michael Sapienza, Fabio Cuzzolin and Philip Torr, Feature sampling and partitioning for visual vocabulary generation on large action classification datasets, arXiv:1405.7545, 29 May 2014
- Fabio Cuzzolin, Diana Mateus and Radu Horaud, Robust temporally coherent Laplacian protrusion segmentation of 3D articulated bodies, arXiv:1405.6563, 26 May 2014
- Fabio Cuzzolin and Stefano Soatto, Using Bilinear Models for View-invariant Action and Identity Recognition, UCLA Technical Report CSD-TR050053, December 17, 2005
- Fabio Cuzzolin and Stefano Soatto, Learning Riemannian Metrics for Classification of Dynamical Models, UCLA Technical Report CSD-TR050054, December 17, 2005
- Fabio Cuzzolin and Stefano Soatto, Using Bilinear Models for View-invariant Identity Recognition from Gait, UCLA Technical Report CSD-TR050007, March 17, 2005
- Fabio Cuzzolin, Alessandro Bissacco, Ruggero Frezza and Stefano Soatto, Towards unsupervised detection of actions in clutter, Technical Report CSD-2000/33, Department of Computer Science, University of California at Los Angeles, Dec 2000

Theses

- Fabio Cuzzolin, *Riconoscimento automatico dei gesti*, ("Automatic gesture recognition", in Italian), MSc dissertation, *Universita' degli Studi di Padova*, Italy, March 1997
- Fabio Cuzzolin, Vision of a generalized probability theory, Ph.D. dissertation, *Universita' degli Studi di Padova*, March 2001

Grants and Funding

To date I attracted **external funding for a total of circa £1,200,000** (not fully incorporating the **€4.3M Horizon 2020 project SARAS**, which I co-wrote with the Coordinator Riccardo Muradore), and **internally-funded studentships for an equivalent amount of £216,000**. As the Head of the AI and Vision group I **annually receive £28,000** in QR money from the Department, as a result of the group's REF 2014 performance. In 2014-2015 four other bids reached the final stage or scored very highly but were eventually not funded, for a total of £1,615,000.

Several grant applications are (as of November 2017) **pending for around £1-2M**, including a Leverhulme Trust Research Grants at the final, full proposal stage, a Horizon 2020 COST action, a Google Research Award, a UKIERI application. A host of other applications are in the making, including two to Wellcome Trust, two Engineering and Physical Sciences (EPSRC) ones, a £2M EPSRC Fellowship application, a H2020 project, and two with Innovate UK. More details below.

Awarded (external)

UK Engineering and Physical Sciences Research Council (EPSRC) - First Grant Scheme Tensorial modeling of dynamical systems for gait and activity recognition	Feb 2011
Own role: Principal Investigator. Period: July 2011 - January 2014. Rated 6/6, 6/6, 5/6, 6/6. The project has generated three articles on PAMI, IJCV and IEEE TFS, and a number of follow-up grant bids. Budget: £122,000	
Onera - Elsevier – Int. Society of Information Fusion (ISIF): Sponsorship of BELIEF 2014	2014
Budget: £7,000.	
Innovate UK: Meta Vision LTD Knowledge Transfer Partnership	Apr 2015
Own role: Academic supervisor. Period: September 2015 - August 2017. Personnel: one KTP associate. Budget: £160,000	
NVIDIA: Hardware Grant Request	Oct 2015
Donation: one Titan X GPU card to support the group's work on online action recognition.	
Horizon 2020, Call ICT-27-2017: SARAS - Smart Autonomous Robotic Assistant Surgeon	Aug 10 2017
Duration: 3 years. Coordinator: U. Verona, Italy. Own role: Scientific Officer (SO) and WP Leader. Together with Coordinator Riccardo Muradore I was the main contributor to the success of this bid. In particular, I have single-handedly rewritten both part 2 (impact) and part 3 (management), without which the project would never have been funded. Budget: €4,315,640 (own share: €596,073).	
Cortexica LTD : Deep learning for activity recognition from videos.	May 2018
Budget: £94,108. Duration: 3 years. Personnel: 1 PhD student.	
Innovate UK - Knowledge Transfer Partnership with Createc (https://www.createc.co.uk)	June 2018
Own role: Academic supervisor and Lead Academic. Budget: £190,000. Duration: 2 years. Personnel: one KTP associate.	

Awarded (internal)

Oxford Brookes University - Central Research Funding (CRF): Uncertainty in Computer Vision	Dec 2008
Travel money for a total of £3,000.	
Oxford Brookes University - "Intelligent Transport Systems" doctoral training programme Multi Sensor Fusion for Simultaneous Localization and Mapping on Autonomous Vehicles	Jan 2011
Own role: Director of Studies. Period: September 2011 - October 2014. One PhD Studentship.	
Oxford Brookes University - Faculty of Technology: Next 10 Programme Award	Oct 2012
Own role: Director of Studies. One PhD Studentship. Period: September 2014 - January 2018.	
Oxford Brookes 150th Anniversary Scholarship: Online action recognition for human-robot interaction	July 2014
Own role: Director of studies. Personnel: one PhD studentship. Period: September 2015-February 2019	
Oxford Brookes - IIT Bombay internship scheme: Action detection and recognition from videos	Jan 2017
Budget: £3,500. Role: Supervisor.	
Oxford Brookes - IIT Bombay internship scheme: Deep-predicting future actions	Nov 2017
Budget: £3,500. Role: Supervisor.	

Pending (with submission date)

Engineering and Physical Sciences Research Council (EPSRC)

UKRI-funded Doctoral Training Centre in Human-Centric Artificial Intelligence

Mar 28 2018

Budget: £5,647,459. Role: Director of the CDT. Personnel: 9 Co-Investigators from across the university. Funding for a minimum of 50 PhD students over a period of 8.5 years is requested.

European Union - Horizon 2020

SMADA – Smart Data Analytics

Apr 17 2018

Duration: 3 years. Budget: € 5,948,961 M. Coordinator: KTH Sweden. Number of partners: 12.

Own role: Scientific Officer and WP Leader. Personnel: 3 postdocs for 2 and ½ years.

Huawei Technologies: Video analysis and activity recognition

now

Budget: £270,000 (startup funding for the year 2018, with the possibility of establishing a joint research centre).

Status: close to sign. Personnel: 1 postdoctoral researcher, 1 PhD student (for the year 2018).

I am also Co-Investigator for a **Y600,000 National Science Foundation of China** grant application, led by Dr Chunlai Zhou.**In preparation (with submission deadline)**

Engineering and Physical Sciences Research Council (EPSRC) – Healthcare Technologies call

Deep learning-based movement analysis in people with prolonged disorder of consciousness

June 2018

Own role: Principal Investigator. Duration: 36 months. Budget: circa £1-1.5M.

Co-applicant: Prof Dawes (MOreS research centre), Dr Derick Wade. Personnel: two/three postdocs.

Leverhulme Trust - Research Projects Grants

Neuroscience-inspired AI for a machine theory of mind

June 2018

Own role: Principal Investigator. Duration: 24 months. Budget: £300,000.

Personnel: two postdocs. Co-Investigator: Prof Barbara Sahakian (University of Cambridge).

Engineering and Physical Sciences Research Council (EPSRC) – Standard mode

EMTUV: Enabling Machines to Truly Understand Videos

July 2018

Own role: Co-Principal Investigator. Duration: 42 months. Budget: £867,647.

PI: Prof Lukaszewicz (University of Oxford). Personnel: two postdocs.

Wellcome Trust

A self-monitoring diabetes tool based on deep learning

Aug 2018

Own role: Co-Investigator. PI: Prof Helen Dawes (Brookes). Budget: £250,000.

Engineering and Physical Sciences Research Council (EPSRC): Fellowship scheme (ICT)

Towards a theory of mind for visual AIs

Sep 2018

Own role: Principal Investigator. Duration: 5 years. Budget: circa £2,000,000.

Personnel: 4 Research Assistants.

European Union - COST Action Proposal

Advancing imprecise probabilities towards stronger foundations and challenging applications

Sep 2018

Own role: Secondary Proposer. Main proposer: Dr Sebastien Destercke (UTC Compiègne). Duration: 4 years.

Leverhulme Trust - Research Projects Grants

Deep-predicting future actions

Sep 2018

Own role: Principal Investigator. Duration: 36 months. Budget: £250,000.

Personnel: one postdocs.

Teaching

I have an **extensive teaching experience at university level in three different countries**, first as a Teaching Assistant (TA) in Padua and Milan, later as a TA at the University of California at Los Angeles, and eventually as the Module Leader for a number of Undergraduate and Postgraduate courses at Oxford Brookes University, UK. At Brookes I have supervised several Master's students' dissertations and third year's final projects, and **I regularly mentor a number of undergraduate students as their Academic Adviser**. As the **Subject Coordinator of the MSc in Computer Vision** I was responsible for embedding the Course within the research activities of the AI and Vision group, and **I personally designed the four core modules** of the course.

Taught courses at PG level: P00990 "Research and Scholarship Methods" (2013-14), P00405 "Mathematical Methods for Computer Vision" (2013-17), P00406 "Machine Learning" (2013-17), P00408 "Advanced Computer Vision" (2015-16), all as the Module leader, plus P00702 "Cyber security and the web" and P00407 "Principles of Computer Vision" as co-teacher. **At UG level:** U08781 "Machine Vision" (2008-2017), U08280 "Advanced Artificial Intelligence" (2009-2013), U08884 "Image Technology" (2009-2015) as the Module Leader, plus U08027 "Current research", U08702 "Multimedia IT skills" and U08055 "Professional issues and computer risks" as co-teacher.

Administrative roles

- **Subject Coordinator for the MSc in Computer Vision** (2014-2017);
- Member of the team who conducted a comprehensive **revalidation of all MSc courses** in our department (February 2013);
- Member of the team who **achieved BCS (British Computer Society) reaccreditation** of all courses (2014-15)
- **Member of interview panels** for a Senior Lectureship in Media Technology, Oxford Brookes, 2009, for postdoctoral positions in the Department (2010, 2011, 2015) and for a Senior Lectureship in Robotics Systems (December 2015);
- Participant in the Oxford Brookes' **Academic Progression Initiative (API), PETAL** (Peer Enhancement of Teaching and Learning): <https://www.brookes.ac.uk/services/ocslid/pese/projects/1-petal/index.html>;
- Participant in the Department of Computing's PRESS and RISE sessions on teaching and research best practice.

In addition, I recently put myself forward for the **position of Research Lead** of my department.

Links with industry

I just completed a **KTP with Meta Vision LTD**, an Oxford company (originally a spinoff of Oxford University) which has as clients very large companies active in the aerospace industry (Ariane), oil industry, on laser inspection of industrial welding. The project aimed to automatically localise and recognise various types of weld defects from 3D reconstructions of the surfaces involved using advanced machine learning. Together with **Ocado**, the home delivery company, I am **engaging Innovate UK for a direct collaboration** in the area of automated event detection and surveillance in their warehouses. The company has huge automated warehouses in which workers ("pickers") are asked to move goods from "red" baskets to "green" baskets which are delivered to customers. A machine learning analysis of the complex tasks they perform can allow the system to predict at each time instant what is the (optimal) task they should perform next, and suggest the next move to pickers using the available monitors. **Ocado** have pledged to support an upcoming EPSRC grant of mine by providing proprietary data from their CCTV cameras and staff time. They are also leading a joint Horizon 2020 bid (NoHands), initially submitted in January 2016, where I am WP leader.

I am discussing a potential 3-year KTP with **Oxehealth, the Oxford University spinoff** leader in healthcare monitoring. Oxehealth will also be project partners in my upcoming EPSRC bid to the "Healthcare technologies" call, will host PhD students of mine for internships, and wishes to have me in their panel of scientific advisors.

Negotiations with **BMW Group** on a comprehensive collaboration on a wide range of problems involving the use of machine learning, vision and augmented reality to improve their industrial processes have reached an advanced stage. I have given an invited presentation at their Knowledge Day, and we are in the process of signing an NDA. Two of my PhD students have won internships at **Disney Research** in Zurich and Carnegie Mellon. Disney is interested in supporting my upcoming EPSRC grant on neural video captioning. The same holds for **Kinesense**, an Irish company active in video surveillance.

In addition, I have longstanding connections with **Google Inc**, in the persons of Rahul Sukthankar, Brian Milch and Vittorio Ferrari, who have acted as Google sponsors for two applications of mine for Google Research Awards. Sukthankar was also part of the steering committee of a recent Leverhulme bid of mine. **Technicolor's** Dr Patrick Perez (formerly at Microsoft Research) was also in that steering committee, and has advised the creation of the MSc in Computer Vision. I have been recently contacted by **Apple Special Projects'** Russ Webb to discuss collaboration in topics of common interest. **Onera**, the French aerospace company have sponsored the recent BELIEF 2014 conference I have organised and chaired. **DAQRI**, the world's leading augmented reality developer, has contacted me in November 2015 to discuss future collaborations. A direct collaboration is being discussed with **Osram**, in the person of Dr Fabio Galasso, on the daily monitoring of people's activities using their electric infrastructure.

As recently as November 2017 I was **headhunted by Huawei for the position of Chief AI Scientist in the UK (Cambridge)**, by **Samsung for the position of Head of their new AI group**, also in Cambridge, and by **Cortexica LTD for a position of Scientific Advisor**. In 2017 I had been contacted by **Amazon Go**, led by Gerard Medioni, **for a position of Principal Scientist with them**.

Selected Referees

Arthur Dempster - Emeritus Professor of Statistics, Harvard University - Department of Statistics, One Oxford Street Cambridge, MA 02138-2901, USA. Phone: +1 617 495-5601 Email: dempster@fas.harvard.edu dempsterap@gmail.com

Teddy Seidenfeld - Professor of Statistics, Carnegie Mellon University - Department of Philosophy, Baker Hall 135J, Pittsburgh (PA) 15213-3890, USA. Phone: +1 412 2682209. Email: teddy@stat.cmu.edu

Frank Coolen - Professor of Statistics, Durham University - Department of Mathematical Sciences, South Road Durham, DH1 3LE, United Kingdom. Phone: +44 (0)191 334 3048. Email: Frank.Coolen@durham.ac.uk

Glenn Shafer - Full Professor, Rutgers Business School - Department of Accounting and Information Systems, 180 University Avenue, Newark, NJ, USA. Phone: +1 973 3531604. Email: gshafer@andromeda.rutgers.edu

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