Peter Tiňo
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Education

05/1997 **PhD** – Institute of Control Theory and Robotics, Slovak Academy of Sciences, Slovakia
Thesis: *Learning Temporally Dependent Associative Mappings with Recurrent Neural Networks*

07/1988 **MSc** – Faculty of Electrical Engineering & Computer Science, Slovak University of Technology, Bratislava, Slovakia
Graduation with Distinction

Career to date

01/2003 – **University of Birmingham, Birmingham, UK**
Lecturer: 01/2003 – 09/2006
Senior Lecturer: 10/2006 – 09/2011
Reader: 10/2011 – 07/2014
Full Professor: 08/2014 –
Research: probabilistic modelling and machine learning for structured data, dynamical systems, evolutionary computation, inter-disciplinary applications of machine learning in astronomy, brain imaging, bio-medical sciences and computational finance
Teaching: Mathematical Foundations of AI and Machine Learning, Nature Inspired Learning, Neural Computation, Intelligent Data Analysis, Imaging and Visualisation Systems, Software Workshop 1, Foundation Year Computer Science

03/2008 – 09/2008 **UK-Hong Kong Fellowship for Excellence, City University of Hong Kong**
Worked with Prof. H. Yan, City on analysis of cDNA micro-array data and promoter recognition.

05/2000 – 12/2002 **Neural Computing Research Group (NCRG), Aston University, Birmingham, UK**
Postdoctoral Research Fellow, worked with Prof. I. Nabney.
Research: probabilistic modelling through latent variable models, data visualisation, machine learning in drug design
Teaching: Practical Computation, Statistical Pattern Analysis

10/1997 – 04/2000 **Austrian Research Institute for Artificial Intelligence, Vienna, Austria**
Postdoctoral Research Fellow, worked with Dr. G. Dorffner.
Research: multifractal analysis, connectionist models of natural language, modelling and analysis of financial data, technical volatility trading

10/1995 – 09/1997 **Slovak University of Technology, Bratislava, Slovakia**, Faculty of Electrical Engineering and Information Technology
Assistant Professor
Research: recurrent neural networks, dynamical systems
Teaching: Neural Networks, Modelling and Simulation, Computer Graphics

08/1994 – 09/1995 **NEC Research Institute, Princeton, USA**
Fulbright Fellow, worked with Prof. C.L. Giles
Research: recurrent neural networks, grammatical inference, dynamical systems

01/1992 – 07/1994 **Slovak University of Technology, Bratislava, Slovakia**, Faculty of Electrical Engineering and Information Technology
Assistant Professor
Research: recurrent neural networks, dynamical systems
Teaching: Neural Networks, Modelling and Simulation, Computer Graphics

10/1989 – 12/1991 **Slovak Academy of Sciences, Bratislava, Slovakia**, Institute of Control Theory and Robotics
Research: fuzzy sets, belief functions, statistical inference

Research

CURRENT RESEARCH INTERESTS

- **Theoretical underpinning of existing machine learning methodologies**.
  Machine learning methodologies have been successfully and widely used in many areas of life, science and engineering. It is imperative that for those technologies we can answer principal questions such as:
  - What are their representational capabilities?
  - How can the induced knowledge be interpreted in a transparent manner?
  - How does data complexity translate into difficulty of learning and complexity of the learnt models?

- **Inter-disciplinary applications of Machine Learning**.
  As more and more data is collected in many different branches of science, engineering, healthcare etc., intelligent processing and understanding of such data collections is a necessary prerequisite for any progress within each specialisation. Truly interdisciplinary approaches are the key to the success, yet much work needs to be done on how to incorporate intricate domain knowledge into machine learning methods so that both sides of the coin - specific domain knowledge approaches and purely data driven learning approaches - are symbiotically blended into superior methods.

- **Learning in the model space:** Potentially huge and diverse data collections can be naturally processed and analyzed in a novel way: Data items are first represented through models constructed to capture data features deemed crucial for further analysis - learning is then performed in the space of models.

- **Modelling of brain imaging data across multiple spatial and temporal scales:**
  Construction of principled models capable of capturing in a unified way small, intermediate and long time scales of runs, sessions and training courses, respectively, while being sufficiently sensitive to spatial scales from localized voxel collections, through Regions of Interest to the whole brain.

- **Learning with privileged information:** In many practical applications there are situations where an additional information is available during the predictive model construction phase, but

not when the model is used in practice. A typical example is galaxy classification where full spectra (carrying a lot of useful information) for some galaxies are available during classifier construction, but not when the model is used to classify new galaxies (for which only simple morphological and/or bulk spectral features are available). I am interested in formulating efficient metric learning approaches to deal with this problem.

- **Analysis of population level complex dynamics:** Many analytical descriptions of population level models are conveniently performed with the assumption of infinite populations. While insightful ideas of different behavioural scenarios can be obtained in this way, if the underlying dynamics is complex, it is not clear how such theoretical results translate into realistic scenario of potentially large, but finite populations. In fact, in the framework of co-evolutionary learning it can shown that the infinite population results may not be directly translatable to the finite population case, even if the finite population is arbitrarily large. I am interested in a systematic study of conditions on complex population level systems under which similar problems occur.
- **Adaptive state space models:** Typically, in order to be able to recursively process sequential data, parametrised learning models are endowed with some form of feed-back mechanism. This turns them in (non-autonomous) dynamical systems. Understanding such systems is a challenge. Many researchers suggested to fix the dynamical state transition part and adapt only the readout from the state space. Deeper understanding of this approach and consequences for learning capabilities it imposes is still an open question.

RESEARCH AWARDS (selected)

2011	**Outstanding Paper of the Year Award - IEEE Transactions on Neural Networks, IEEE Computational Intelligence Society** H. Chen, P. Tino, X. Yao: *Probabilistic Classification Vector Machines.* IEEE Transactions on Neural Networks, 20(6), pp 901-914, 2009.
2010	**Outstanding Paper of the Year Award - IEEE Transactions on Evolutionary Computation, IEEE Computational Intelligence Society** S.Y. Chong, P. Tino, X. Yao: *Measuring Generalization Performance in Co-evolutionary Learning.* IEEE Transactions on Evolutionary Computation, 12(4), pp 479-505, 2008.
2008	**UK-Hong Kong Fellowship for Excellence, DfES**
1998	**Outstanding Paper of the Year Award - IEEE Transactions on Neural Networks, IEEE Computational Intelligence Society** T. Lin, B.G. Horne, P. Tiňo, C.L. Giles: *Learning long-term dependencies with NARX recurrent neural networks. IEEE Transactions on Neural Networks*, 7(6), pp. 1329-1338, 1996.
1994	**Fulbright Fellowship** NEC Research Institute, Princeton, NJ, USA

PRINCIPAL RESEARCH GRANTS (selected)

01/2024 – 01/2028	**Horizon Europe, Doctoral Networks - Marie Sklodowska-Curie Actions**, 10 partners, lead by Prof Johan Knapen, IAC (Instituto de Astrofísica de Canarias), Spain

total EUR 2,662,798, **UB share GBP 256,488**
Principal Investigator in Birmingham
EDUCADO - Exploring the Deep Universe by Computational Analysis of Data from Observations

01/2023 – 12/2027 **EPSRC**, **Prosperity Partnerships**, EP/X025454/1
PI Prof Nicholas Green, University of Birmingham; Dr Owen Draper, Rolls Royce
GBP 4,397,539 (EPSRC), matched with **GBP 4,397,539 (Rolls Royce plc)**, **School of Comp Sci share GBP 611,137**
Co-Investigator, leading the AI and modelling theme
ARCANE - Advanced Research into Crystallographic Anisotropy & Nucleation Effects in single crystals.

10/2021 – 09/2024 **ESRC**, ES/V003526/1, **GBP 465,148**
Co-Investigator, PI - Dr Stephane De Brito
Trait and State Impulsivity in Maltreated Children.

06/2021 – 05/2024 **NIHR**, NIHR202632, multi-institution project lead by Dr Thomas Jackson and Dr Krishnarajah Nirantharakumar, Medical Sciences, University of Birmingham,
total GBP 3,219,952, School of Comp Sci share GBP 475,192
Co-Investigator
OPTIMAL - OPTIMising therapies, discovering therapeutic targets and AI assisted clinical management for patients Living with complex multimorbidity.

01/2020 – 12/2021 **Alan Turing Institute**, ATI Fellowship 1056900, **GBP 155,288**
Principal Investigator
Machine Learning in the Space of Inferential Models.

09/2018 – 08/2020 **MRC**, MR/R017913/1, **MRC Research Training Fellowship - Dr E S Baranowski (researcher)**, **GBP 154,434**
Co-Investigator, PI - Prof Wiebke Arlt
Steroid Metabolomics for Diagnosis of Inborn Steroidogenesis Disorders

04/2018 – 03/2023 **The Wellcome Trust**, Investigator Grant 209492/Z/17/Z to Wiebke Arlt, **GBP 2,389,852**
Co-Investigator, PI - Prof Wiebke Arlt
Dissecting Androgen Excess And Metabolic Dysfunction - An Integrated Systems Approach To PolyCystic Ovary Syndrome (DAISY-PCOS)

04/2017 – 03/2021 **EU Horizon 2020, Marie Sklodowska-Curie Doctoral Training Networks**.
9 partners lead by Prof Reynier Peletier, University of Groningen, NL
total EUR 3,700,000, **UB share EUR 546,000**
Principal Investigator in Birmingham
SUNDIAL - SUrvey Network for Deep Imaging Analysis and Learning

02/2016 – 01/2018 **EU Horizon 2020**, Marie Skłodowska-Curie Individual Fellowships 657027, **EUR 195,455**
Principal Investigator
CoEvolFramework – Unified Framework for the Analysis of Co-evolutionary Systems. Researcher: **Dr Siang Yew Chong**

04/2015 – 03/2018 **Technology Strategy Board**, TS/M010236/1, **GBP 368,657**
Co-Investigator, PI - Dr Zsuzsanna Nagy
The utility of mTOR signalling pathway dysregulation and mutational profiling in the risk stratification for future cognitive decline in MCI

07/2015 – 06/2017 **EU Horizon 2020**, Marie Skłodowska-Curie Individual Fellowships 659104, **EUR 183,455**
Principal Investigator
LeSoDyMAS – Learning in the Space of Dynamical Models of Adrenal Steroidogenesis. Researcher: **Dr Kerstin Bunte**

01/2014 – 12/2015 **EU FP7**, Marie-Curie Intra-European Fellowship 327791, **EUR 221,606**
Principal Investigator
ProMoS— Probabilistic Models in Pseudo-Euclidean Spaces. Researcher: **Dr Frank Schleif**

10/2013 – 09/2016 **EPSRC**, EP/L000296/1. **total GBP 1,304,311**, **UB share GBP 415,342**
Principal Investigator
Personalised Medicine through Learning in the Model Space
Project lead and coordinator - 6 UK institutions: University of Birmingham, University of Warwick, University College London, King's College London, University of Exeter, Durham University

04/2013 – 03/2017 **MRC**, MR/K021192/1, **GBP 2,110,279**
Co-Investigator
A multi-disciplinary approach to understanding the immunological basis and potential prevention of graft versus host disease

10/2010 – 03/2014 **BBSRC**, BB/H012508/1, **GBP 767,105**
Principal Investigator
Unified probabilistic modelling of adaptive spatial temporal structures in the human brain

01/2011 – 12/2013 **EU FP7**, 270428. 5 partners - **total EUR 2,790,000**, **UB share EUR 453,526**
Co-Investigator
iSense - Making Sense of Nonsense

10/2004 – 09/2007 **PPARC**, PP/C503138/1, **GBP 152,210**
Co-Investigator
Designer algorithms for astronomical data mining

EDITORSHIPS OF JOURNALS (selected)

01/2021 – 01/2025 **Associate Editor** of **Neural Networks** (Elsevier)

01/2015 – **Associate Editor** of **Neural Computation** (MIT Press)

01/2015 – 01/2017 **Associate Editor** of **IEEE Transactions on Cybernetics** (IEEE)

05/2013 – 12/2018 **Associate Editor** of **IEEE Transactions on Neural Networks and Learning Systems** (IEEE)

12/2011 – 06/2017 **Associate Editor** of **Scientific Reports** (Nature Publishing Group)
Mathematical Physics, Thermodynamics and Nonlinear Dynamics section of the Editorial Board

07/2007 – 12/2015 **Associate Editor** of **Neural Processing Letters** (Springer)

INVITED TALKS (selected)

08/04/2024	**PAP/MAS Colloquium, Nanyang Technological University**, Singapore *Searching for Multiple Low-dimensional Needles in a Higher-dimensional Haystack* **Invited talk**
8/12/2023	**Emergent Algorithmic Intelligence Workshop - Bridging Disciplines: Novel AI driven interdisciplinary techniques and methods**, Emergent AI Center, Mainz, Germany *Learning in the model space.* **Keynote**
18/10/2023	**Workshop on Non-autonomous Dynamics in Complex Systems: Theory and Applications to Critical Transitions**, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany *Non-autonomous dynamical systems as temporal feature spaces for machine learning applications - minimal complexity constructions and universality.* **Invited talk**
17/11/2021	**London Mathematical Society Computer Science Colloquium 2021** *From dynamical systems to kernel based feature spaces and back* **Invited talk**
14/09/2021	**30th International Conference on Artificial Neural Networks. (ICANN 2021)**, Bratislava, Slovakia *Searching for multiple low-dimensional needles in a higher-dimensional haystack.* **Keynote**
20/07/2021	**International Joint Conference on Neural Networks (IJCNN 2021)**, Shenzhen, China *Fascinating World of Recurrent Networks: A Personal View* **Plenary**
27/06/2021	**17th International Conference on Artificial Intelligence Applications and Innovations (AIAI 2021)**, Crete, Greece *Unveiling Recurrent Neural Networks - What Do They Actually Learn and How?* **Keynote**
18/09/2019	**The 1st International Workshop on Reservoir Computing (RC 2019) at ICANN 2019**, **Munich, Germany** *Reservoirs as temporal filters and feature mappings* **Keynote**
25/06/2019	**Astroinformatics 2019** , Caltech, Pasadena, CA, USA *Dynamical Systems as Feature Representations for Learning from Data* **Invited talk**
28/07/2015	**Sister Conference - Machine Learning track, IJCAI 2015**, **Buenos Aires, Argentina** *Learning in the Model Space for Temporal Data* **Invited sister conference talk in the Machine Learning track at IJCAI-15**

05/07/2013 **Natural Computing Applications Forum**, Oxford University, UK
Learning in the Model Space for Sequential Data - from Temporal Filters to Sequence Kernels and Back
Invited talk

04/10/2012 **International Conference on the Theory and Practice of Natural Computing**, Tarragona, Spain
Computational Intelligence in Astronomy - Win-Win Situation
Invited talk

08/10/2010 **Workshop on Advanced Statistical Techniques for Astronomy**,
Inter-University Centre for Astronomy and Astrophysics, Pune, India
Generative Probabilistic Modelling in Astrophysics
Invited talk

10/07/2010 **Cognitive and Neural Models for Automated Processing of Speech and Text (CONAS 2010)**, Ghent, Belgium
Reservoir Models - How Simple Can We Get?
Invited talk

03/04/2008 **City University of Hong Kong**, Hong Kong
Talk invited by **IEEE Hong Kong Section Systems, Man and Cybernetics Chapter** and **Signal Processing Chapter**
Model based Clustering and Topographic Mapping of Structured Data
Invited talk

12/12/2003 **NIPS workshop** on **Advances in Recurrent Neural Networks**, Whistler, Canada
Recurrent/Recursive Networks as Non-Autonomous Dynamical Systems
Invited talk

08/04/2003 **Carnegie Mellon University**, USA
Markovian Architectural Bias of Recurrent Neural Networks
Invited talk

SEMINAR TALKS

>70 seminar talks at a variety of institutions, including Oxford University, Imperial College London, University College London (UCL), University of Manchester, Southampton University, Liverpool University, Exeter University, University of Surrey, University of Bath, Newcastle University, Groningen University (NL) and University of Otago (NZ)

RESEARCH PUBLICATIONS

> 240 publications, see petertino.github.io/web/my.publ.html

SELECTED JOURNAL PAPERS

- D. Vaghari, G. Mohankumar, K. Tan, A. Lowe, C. Shering, P. Tiňo, Z. Kourtzi: AI-guided patient stratification improves outcomes and efficiency in the AMARANTH Alzheimer's Disease clinical trial.
  Nature Communications, 16, 6244, doi.org/10.1038/s41467-025-61355-3, 2025.

- R.S. Fong, B. Li, P. Tiňo: Linear Simple Cycle Reservoirs at the edge of Stability perform Fourier decomposition of the input driving signals.
  Chaos, 4 (35), pp. 043109, 2025.
  Focus Issue on *Nonautonomous Dynamical Systems: Theory, Methods, and Applications.*

- A. Taghribi, M. Canducci, M. Mastropietro, S. De Rijcke, R. F. Peletier, P. Tiňo, K. Bunte: More than a void? The detection and characterization of cavities in a simulated galaxy's interstellar medium.
  Astronomy and Computing, (51), 100923, 2025.

- T. James, B. Williamson, P. Tiňo, N. Wheeler: Whole-Genome Phenotype Prediction with Machine Learning: Open Problems in Bacterial Genomics.
  Bioinformatics, 7 (41), pp. btaf206, 2025.

- P. Awad et al.: S^5: New insights from deep spectroscopic observations of the tidal tails of the globular clusters NGC 1261 and NGC 1904.
  Astronomy and Astrophysics, (693), A69, 2025.

- B. Li, S.R. Fong, P. Tiňo: Simple Cycle Reservoirs are Universal.
  Journal of Machine Learning Research, 25(158), pp. 1-28, 2024

- M. Yan, C. Huang, P. Bienstman, P. Tino, W. Lin, J. Sun: Emerging opportunities and challenges for the future of reservoir computing.
  Nature Communications, 15, 2056, 2024.

- M. A. Raj, P. Awad, R. F. Peletier, R. Smith, U. Kuchner, R. van de Weygaert, N. I. Libeskind, M. Canducci, P. Tiňo, K. Bunte: The large-scale structure around the Fornax-Eridanus Complex.
  Astronomy and Astrophysics, accepted, 2024.

- L.Y. Lee, D. Vaghari, M.C. Burkhart, P. Tiňo, M. Montagnese, Zh. Li, K. Zühlsdorff, J. Giorgio, G. Williams, E. Chong, Ch. Chen, B.R. Underwood, T. Rittman, Z. Kourtzi, Alzheimer's Disease Neuroimaging Initiative: Robust and interpretable AI-guided marker for early dementia prediction in real-world clinical settings.
  eClinicalMedicine, 102725. DOI: https://doi.org/10.1016/j.eclinm.2024.102725, 2024.

- M.C. Burkhart, L.Y. Lee, D. Vaghari, An Qi Toh, E. Chong, Ch. Chen, P. Tiňo, Z. Kourtzi: AI-guided early dementia prediction using unsupervised multimodal modeling of brain health trajectories.
  Scientific Reports, 14, 10755, 2024.

- P. Awad, M. Canducci, E. Balbinot, A. Viswanathan, H. C. Woudenberg, O. Koop, R. Peletier, P. Tiňo, E. Starkenburg, R. Smith, K. Bunte: Swarming in stellar streams: Unveiling the structure of the Jhelum stream with ant colony-inspired computation.
  Astronomy and Astrophysics, 683, A14, 2024.

- N. Rodgers, P. Tiňo, S. Johnson: Strong Connectivity in Real Directed Networks.
  Proceedings of the National Academy of Sciences (PNAS), 120 (12), e2215752120, 2023.

- P. Awad, R. Peletier, M. Canducci, R. Smith, A. Taghribi, M. Mohammadi, J. Shin, P. Tiňo, K. Bunte: Swarm Intelligence-based Extraction and Manifold Crawling Along the Large-Scale Structure.
  Monthly Notices of the Royal Astronomical Society, 3 (520), pp. 4517–4539, 2023.

- R. Wang, V. Gates, Y. Shen, P. Tiňo, Z. Kourtzi: Flexible Structure Learning Under Uncertainty.
  Frontiers in Neuroscience (section Visual Neuroscience), 17:1195388, doi: 10.3389/fnins.2023.1195388, 2023.

- N. Rodgers, P. Tiňo, S. Johnson: Influence and Influenceability: Global Directionality in Directed Complex Networks.
  Royal Society Open Science, 8(10), 221380, 2023.

- Sh. Zhang, P. Tiňo, X. Yao: Hierarchical Reduced-Space Drift Detection Framework for Multivariate Supervised Data Streams.
  IEEE Transactions on Knowledge and Data Engineering, 3 (35), pp. 2628-2640, 2023.

- J. Giorgio, W. J. Jagust, S. Baker, S. M. Landau, P. Tiňo, Z. Kourtzi: A robust and interpretable machine learning approach using multimodal biological data to predict future pathological tau accumulation.
  Nature Communications, 13, 1887, 2022.

- M. Canducci, P. Awad, A. Taghribi, M. Mohammadi, M. Mastropietro, S. De Rijcke, R. Peletier, R. Smith, K. Bunte, P. Tiňo: 1-DREAM: 1D Recovery, Extraction and Analysis of Manifolds in noisy environments.
  Astronomy and Computing, (41), 100658, 2022.

- M. Canducci, P. Tiňo, M. Mastropietro: Probabilistic modelling of general noisy multi-manifold data sets.
  Artificial Intelligence, (302), 103579, 2022.

- N. Rodgers, P. Tiňo, S. Johnson: Network hierarchy and pattern recovery in directed sparse Hopfield networks.
  Physical Review E, 105(6), 064304, 2022.

- F. Tang, P. Tiňo, H. Yu: Generalized Learning Vector Quantization With Log-Euclidean Metric Learning on Symmetric Positive Definite Manifold.
  IEEE Transactions on Cybernetics, doi: 10.1109/TCYB.2022.3178412, 2022.

- T. Goodman, K. van Gemst, P. Tiňo: A Geometric Framework for Pitch Estimation on Acoustic Musical Signals.
  Journal of Mathematics and Music, doi:10.1080/17459737.2021.1979116, 2021.

- P. Verzelli, C. Alippi, L. Livi, P. Tiňo: Input-to-State Representation in linear reservoirs dynamics.
  IEEE Transactions on Neural Networks and Learning Systems, accepted, 2021.

- F. Tang, M. Fan, P. Tiňo: Generalized Learning Riemannian Space Quantization: a Case Study on Riemannian Manifold of SPD Matrices.
  IEEE Transactions on Neural Networks and Learning Systems, 1(32), pp. 281-292, 2021.

- P. Tiňo: Dynamical Systems as Temporal Feature Spaces.
  Journal of Machine Learning Research, 21(44), pp. 1-42, 2020.

- I. Akerman, B. Kasaai, A. Bazarova, P.B. Sang. I. Peiffer, M. Artufel, R. Derelle, G. Smith, M. Rodriguez-Martinez, M. Romano, S. Kinet, P. Tiňo, Ch. Theillet, N.Taylor, B. Ballester, M.

Méchali: A predictable conserved DNA base composition signature defines human core DNA replication origins.
Nature Communications, 11, 4826, 2020.
doi.org/10.1038/s41467-020-18527-0

- J. Giorgio, S. Landau, W. Jagust, P. Tiňo, Z. Kourtzi: Modelling prognostic trajectories of cognitive decline due to Alzheimer's disease.
NeuroImage: Clinical, 26, 102199, 2020.
doi: https://doi.org/10.1016/j.nicl.2020.102199.

- V. Karlaftis, J. Giorgio, P. Vertes, R. Wang, Y. Shen, Tiňo, A. Welchman, Z. Kourtzi: Multimodal imaging of brain connectivity reveals predictors of individual decision strategy in statistical learning.
Nature Human Behaviour, 3, pp. 297–307, 2019.

- S. Y. Chong, P. Tiňo, J. He: Coevolutionary Systems and PageRank.
Artificial Intelligence, (277), pp. 103164, 2019.

- K. Bunte, D.J. Smith, M.J. Chappell, Z.K. Hassan-Smith, J.W. Tomlinson, W. Arlt, P. Tiňo: Learning Pharmacokinetic Models for in vivo Glucocorticoid Activation.
Journal of Theoretical Biology, 455, pp. 222-231, DOI:10.1016/j.jtbi.2018.07.025, 2018.

- S. Y. Chong, P. Tiňo, J. He, X. Yao: A New Framework for Analysis of Coevolutionary Systems - Directed Graph Representation and Random Walks.
Evolutionary Computation, accepted, DOI:10.1162/evco-a/00218, 2018.

- J. Giorgioa, V. M. Karlaftis, R. Wang,Y. Shen, P. Tiňo, A. Welchman, Z. Kourtzi: Functional brain networks for learning predictive statistics.
Cortex, accepted, DOI: 10.1016/j.cortex.2017.08.014, 2018.

- Y. Shen, P. Tiňo, K. Tsaneva-Atanasova: Classification framework for partially observed dynamical systems.
Physical Review E, 95, 043303, 2017.

- F.M. Schleif, P. Tiňo: Indefinite Core Vector Machine.
Pattern Recognition, 71, pp.187-195, 2017.

- S. AL Otaibi, P. Tiňo, J. C. Cuevas-Tello, I. Mandel, S. Raychaudhury: Kernel regression estimates of time delays between gravitationally lensed fluxes.
Monthly Notices of the Royal Astronomical Society, 1(459), pp. 139–146, 2016.

- F. Tang, P. Tiňo, P. A. Gutierrez, H. Chen: The Benefits of Modelling Slack Variables in SVMs.
Neural Computation, 4(27), pp. 954-981, 2015.

- Y. Shen, S.D. Mayhew, Z. Kourtzi, P. Tiňo: Spatial-temporal modelling of fMRI data through spatially regularised mixture of hidden process models.
Neuroimage, 84(1), pp. 657-671, 2014.

- H. Chen, P. Tiňo, X. Yao, A. Rodan: Learning in the Model Space for Fault Diagnosis.
IEEE Transactions on Neural Networks and Learning Systems, 25(1), pp. 124-136, 2014.

- P. Tiňo, S.Y. Chong, X. Yao: Complex Co-Evolutionary Dynamics - Structural Stability and Finite Population Effects.
IEEE Transactions on Evolutionary Computation, 17(2), pp. 155-164, 2013.

- P. Tiňo: Pushing for the Extreme: Estimation of Poisson Distribution from Low Count Unreplicated Data - How Close Can We Get?
  Entropy, 15(4), pp. 1202-1220, 2013.
  Special Issue on *Distance in Information and Statistical Physics*.

- S. Fouad, P. Tiňo, S. Raychaudhury, P. Schneider: Incorporating Privileged Information Through Metric Learning.
  IEEE Transactions on Neural Networks and Learning Systems, 24(7), pp. 1086 - 1098, 2013.

- Ph. Weber, B. Bordbar, P. Tiňo: A Framework for the Analysis of Process Mining Algorithms.
  IEEE Transactions on Systems, Man, and Cybernetics Part A: Systems and Humans, 43(2), pp. 303-317, 2013.

- B. Rudolf, M. Markošová, M. Čajagy, P. Tiňo: Degree Distribution and Scaling in the Connecting - Nearest - Neighbors Model.
  Physical Review E, 85(2), 026114, 2012.

- A. Rodan, P. Tiňo: Minimum Complexity Echo State Network.
  IEEE Transactions on Neural Networks, 22(1), pp 131-144, 2011.

- P. Tiňo, Z. Hongya, H. Yan: Searching for co-expressed genes in three-color cDNA microarray data using a probabilistic model based Hough Transform.
  IEEE/ACM Transactions on Computational Biology and Bioinformatics, 8(4), pp 1093-1107, 2011.

- P. Tiňo: Basic Properties and Information Theory of Audic-Claverie Statistic for Analyzing cDNA Arrays.
  BMC Bioinformatics, 10:310, 2009.

- P. Tiňo: Bifurcation Structure of Equilibria of Iterated Softmax.
  Chaos, Solitons & Fractals, 41, pp 1804-1816, 2009.

- H. Chen, P. Tiňo, X. Yao: Probabilistic Classification Vector Machines.
  IEEE Transactions on Neural Networks, 20(6), pp 901-914, 2009.

- N. Gianniotis, P. Tiňo: Visualisation of tree-structured data through generative topographic mapping.
  IEEE Transactions on Neural Networks, 19(8), pp 1468-1493, 2008.

- J.C. Cuevas-Tello, P. Tiňo, S. Raychaudhury: How accurate are the time delay estimates in gravitational lensing?
  Astronomy and Astrophysics, 454(3), pp 695-706, 2006.

- G. Brown, J. Wyatt, P. Tiňo: Managing Diversity in Regression Ensembles.
  Journal of Machine Learning Research, 6, pp. 1621-1650, 2005.

- P. Tiňo, M. Čerňanský, L. Beňúšková: Markovian Architectural Bias of Recurrent Neural Networks.
  IEEE Transactions on Neural Networks, 15(1), pp. 6-15, 2004

- P. Tiňo, B. Hammer: Architectural Bias in Recurrent Neural Networks - Fractal Analysis.
  Neural Computation, 15(8), pp. 1931-1957, 2003.

- B. Hammer, P. Tiňo: Recurrent neural networks with small weights implement definite memory machines.
  Neural Computation, 15(8), pp. 1897-1926, 2003

- P. Tiňo, I. Nabney: Hierarchical GTM: constructing localized non-linear projection manifolds in a principled way.
  IEEE Transactions on Pattern Analysis and Machine Intelligence, 24(5), pp. 639-656, 2002.

- P. Tiňo: Multifractal properties of Hao's geometric representations of DNA sequences.
  Physica A: Statistical Mechanics and its Applications, 304(3-4), pp. 480-494, 2002.

- P. Tiňo, Ch. Schittenkopf, G. Dorffner: Volatility Trading via Temporal Pattern Recognition in Quantized Financial Time Series.
  Pattern Analysis and Applications, 4(4), pp. 283-299, 2001.

- P. Tiňo, B.G. Horne, C.L. Giles: Attractive Periodic Sets in Discrete Time Recurrent Networks (with Emphasis on Fixed Point Stability and Bifurcations in Two–Neuron Networks).
  Neural Computation, 13(6), pp. 1379-1414, 2001.

- P. Tiňo, G. Dorffner: Predicting the future of discrete sequences from fractal representations of the past.
  Machine Learning, 45(2), pp. 187-218, 2001.

- P. Tiňo: Spatial Representation of Symbolic Sequences through Iterative Function Systems.
  IEEE Transactions on Systems, Man, and Cybernetics Part A: Systems and Humans, 29(4), pp. 386-392, 1999.

- T. Lin, B.G. Horne, P. Tiňo, C.L. Giles: Learning long-term dependencies with NARX recurrent neural networks.
  IEEE Transactions on Neural Networks, 7(6), pp. 1329-1338, 1996.

SELECTED CONFERENCE PAPERS – REFEREED

- R.S. Fong, B. Li, P. Tino: Universality of Real Minimal Complexity Reservoir.
  In Proceedings of the **AAAI Conference on Artificial Intelligence (AAAI 2025)**, 39(16), 16622-16629, 2025. doi.org/10.1609/aaai.v39i16.33826

  Sh. Zhang, Ch. Pan, L. Song, X. Wu, Z. Hu, K. Pei, P. Tiňo, X. Yao: Unsupervised Out-Of-Distribution Detection with Classification-augmented Memory Autoencoder.
  In **European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD 2021)**, accepted, 2021.

- Sh. Zhang, Ch. Pan, L. Song, X. Wu, Z. Hu, K. Pei, P. Tiňo, X. Yao: Unsupervised Out-Of-Distribution Detection with Classification-augmented Memory Autoencoder.
  In **European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD 2021)**, accepted, 2021.

- M. Perez-Ortiz, P. Tiňo, R. Mantiuk, S. C. Hervás Martínez: Exploiting Synthetically Generated Data with Semi-Supervised Learning for Small and Imbalanced Datasets.
  In **AAAI Conference on Artificial Intelligence (AAAI 2019)**, AAAI Press, Palo Alto, California USA, 2019.

- H. Chen, F. Tang, P. Tiňo, A. G. Cohn, X. Yao: Model Metric Co-learning for Time Series Classification.
  In **28th International Joint Conference on Artificial Intelligence (IJCAI 2015)**, pp. 3387-3394, AAAI Press, 2015.

- Y. Shen, S.D. Mayhew, Z. Kourtzi, P. Tiňo: A spatial mixture approach to inferring sub-ROI spatio-temporal patterns from rapid event-related fMRI data.
  In **16th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2013)**, pp. 657-664, Lecture Notes in Computer Science, Springer-Verlag, LNCS 8150, 2013.

- H. Chen, F. Tang, P. Tiňo, X. Yao: Model-based Kernel for Efficient Time Series Analysis.
  In **19th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2013)**, pp. 392-400, ACM New York, NY, USA. 2013.

- X. Wang, P. Tiňo, M. Fardal: Multiple Manifold Learning Framework based on Hierarchical Mixture Density Model. In **Machine Learning and Knowledge Discovery in Databases** (European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases - **ECML PKDD 2008**), pp. 566-581, Lecture Notes in Computer Science, LNCS 4984, Springer-Verlag, 2008. ISBN: 98-3-540-87480-5

- P. Tiňo, N. Gianniotis: Metric Properties of Structured Data Visualizations through Generative Probabilistic Modeling.
  In **20th International Joint Conference on Artificial Intelligence - IJCAI'07**, (ed.) Manuela M. Veloso. pp. 1083-1088, AAAI Press, 2007.

- J.C. Cuevas-Tello, P. Tiňo, S. Raychaudhury: A kernel-based approach to estimating phase shifts between irregularly sampled time series: an application to gravitational lenses.
  In **17th European Conference on Machine Learning - ECML 2006**, (eds) J. Fuernkranz, T. Scheffer, M. Piliopoulou. pp. 614-621, Lecture Notes in Computer Science, Springer-Verlag, 2006. ISBN: 978-3-540-45375-8

- P. Tiňo: Critical Temperatures for Intermittent Search in Self-Organizing Neural Networks.
  In Parallel Problem Solving from Nature - **PPSN IX**, (eds) T.P. Runarsson, H-G Beyer, E. Burke, J J. Merelo-Guervos, L. Darrell Whitley, X. Yao. pp. 633-640, Lecture Notes in Computer Science, Springer-Verlag, 2006. ISBN: 978-3-540-38990-3

- P. Tiňo, A. Kabán, Y. Sun: A generative probabilistic approach to visualizing sets of symbolic sequences.
  The Tenth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), (eds) R. Kohavi, J. Gehrke, W. DuMouchel, J. Ghosh. pp. 701-706, ACM Press, 2004. ISBN: 1-58113-888-1

- Sh. Parfitt, P. Tiňo, G. Dorffner: Graded grammaticality in Prediction Fractal Machines.
  In **Advances in Neural Information Processing Systems NIPS 12**, (eds) S. A. Solla, T. K. Leen, K-R. Müller. pp. 52-58, MIT Press, 2000. ISBN: 0-262-19450-3

- P. Tiňo, G. Dorffner: Building predictive models from spatial representations of symbolic sequences.
  In **Advances in Neural Information Processing Systems NIPS 12**, (eds) S. A. Solla, T. K. Leen, K-R. Müller. pp. 645-651, MIT Press, 2000. ISBN: 0-262-19450-3

Supervision

RESEARCH STUDENTS SUPERVISED TO COMPLETION

2018 – 2024 **Dr Vahab Samandi (primary supervisor)**, co-supervised with Dr Rami Bahsoon
Machine Learning for Task Duplication

2021 – 2024 **Dr Niall Rodgers (co-supervisor)**, co-supervised with Dr Sam Johnson (School of Mathematics)
Trophic Level Analysis of Complex Graph-Based Systems

2019 – 2024 **Dr Hayatullahi Adeyemo (co-supervisor)**, co-supervised with Dr Rami Bahsoon
Automated Test Case Generation for Embedded Cyber Systems

2017 – 2024 **Dr Krishna Gokhale (co-supervisor)**, co-supervised with Dr Krishnarajah Nirantharakumar (Institute of Applied Health Research)
Machine Learning on Medical THIN Database

2020 – 2024 **Dr Bianca Diaconu (co-supervisor)**, co-supervised with Dr Stephane De Brito (School of Psychology)
Modelling of resilient functioning after childhood maltreatment

2018 – 2024 **Dr Giuseppe Serra (primary supervisor)**, co-supervised with Prof Xin Yao (UoB and SUSTech) and Dr Zhao Xu (NEC Labs Europe)
Interpretable Rating Models

2018 – 2023 **Dr Xinyue Chen (primary supervisor)**, co-supervised with Prof Wiebke Arlt (Institute of Metabolism and Systems Research)
Learning in the Space of Pathway Models

2017 – 2023 **Dr Shuyi Zhang (primary supervisor)**, co-supervised with Prof Xin Yao (SUSTech)
On-line Learning Under Concept Drift and Class Imballance

2018 – 2022 **Dr Abolfazl Taghribi (co-supervisor)**, co-supervised with Dr Kerstin Bunte (Groningen University, NL)
Ant Colonies for Multi-Manifold Learning and Topological Data Analysis

2018 – 2022 **Dr Stephen Friess (primary supervisor)**, co-supervised with Prof Xin Yao (UoB and SUSTech)
Transfer Learning in Optimisation

2017 – 2022 **Dr Yu Zhang (primary supervisor)**, co-supervised with Prof Ke Tang (SUSTech)
Interpretable Deep Neural Network Models

2018 – 2022 **Dr Elisabeth S Baranowski (co-supervisor)**, co-supervised with Prof Wiebke Arlt (Institute of Metabolism and Systems Research)
Steroid Metabolomics for Diagnosis of Inborn Steroidogenesis Disorders

2017 – 2022 **Dr Marco Canducci (primary supervisor)**
Automated Calibration of Galaxy Disruption Models Using Machine Learning

2018 – 2022	**Dr Thomas Goodman (primary supervisor)** *Automated Transcription of Polyphonic Music*
2016 – 2020	**Dr Mohammed Rupawala (co-supervisor)**, co-supervised with Dr Damian Cruse (School of Psychology), Dr Hamid Dehghani (School of Computer Science) and Dr Sam Lucas (School of Sport, Exercise and Rehabilitation Sciences) *Simultaneous electroencephalography and functional near-infrared spectroscopy for accurate diagnosis of prolonged disorders of consciousness*
2016 – 2020	**Dr Kamlesh Patel (co-supervisor)**, co-supervised with Prof Paula Mendes (School of Chemical Engineering) and Prof Janet Lord (School of Immunity and Infection) *Diagnostic Technology for Differentiating Sterile and Non-Sterile Inflammation*
2016 – 2020	**Dr Simon Fong (primary supervisor)**, co-supervised with Prof Joshua Knowles *Information geometry on dually flat manifolds*
2016 –2019	**Dr Ruth Pauli (co-supervisor)**, co-supervised with Dr Stephane De Brito and Dr Amanda Wood (School of Psychology) *Classification and prediction of psychiatric disorders on brain imaging data*
2016 – 2019	**Dr Yi Chen (primary supervisor)** *Parallelism in Process mining*
2013 – 2019	**Dr Hanin Alahmadi (primary supervisor)** co-supervision with Dr Yuan Shen (NTU) *Exploiting Privileged Information in Brain Imaging Data*
2013 – 2018	**Dr Nahed Alowadi (primary supervisor)** co-supervision with Dr Yuan Shen (NTU) *Population Level Modeling of Within-ROI fMRI Signals*
2014 – 2018	**Dr Theofania (Fani) Tsapeli (co-supervisor)**, co-supervision with Dr Mirco Musolesi (UCL) *Data Analytics from Complex Networks*
2013 – 2017	**Dr Rafee Ibrahem (primary supervisor)** *Probabilistic Huff Transform for Galaxy Group Detection*
2013 – 2017	**Dr Abdessalam Habbash (co-supervisor)**, co-supervision with Dr Rami Bahsoon *Machine Learning in Cloud Computing*
2012 – 2016	**Dr Sultanah Al Otaibi (primary supervisor)** *Probabilistic Modelling Approaches to Delay Estimation in Gravitationally Lensed Signals*
2011 – 2015	**Dr Fengzhen Tang (primary supervisor)** *Machine Learning in the Model Space*
2010 – 2013	**Dr Shereen Fouad (primary supervisor)** *Metric Learning for Incorporating Privileged Information in Prototype-Based Models*
2009 – 2013	**Dr Philip Weber (co-supervisor)**, co-supervised with Dr Behzad Bordbar *A Framework for the Analysis and Comparison of Process Mining Algorithms*

2008 – 2012 **Dr Ali Al Rodan (primary supervisor)**
Architectural Designs of Echo State Network

2007 – 2012 **Dr Jakub Mažgút (primary supervisor)**, supervised at Slovak Technical University
Topographic Mapping of Tensor Data

2005 – 2010 **Dr Xioxia Wang (primary supervisor)**
Manifold Aligned Density Estimation

2005 – 2010 **Dr Richard Price (primary supervisor)**, co-supervised with Dr Georgios Theodoropoulos
Using Current Uptime to Improve Failure Detection in Peer-to-Peer Networks

2005 – 2008 **Dr Huanhuan Chen (co-supervisor)**, co-supervised with Prof Xin Yao
Diversity and Regularization in Neural Network Ensembles
- **IEEE Computational Intelligence Society Outstanding PhD Dissertation Award**
- **Runner-up position in the CPHC/BCS Distinguished Dissertation competition 2009**

2004 – 2007 **Dr Juan Carlos Cuevas Tello (primary supervisor)**, co-supervised with Dr Somak Raychaudhury (Physics and Astronomy)
Estimating Time Delays Between Irregularly Sampled Time Series

2004 – 2007 **Dr Siang Yew Chong (co-supervisor)**, co-supervised with Prof Xin Yao
Generalization and Diversity in Co-evolutionary Learning
- **IEEE Computational Intelligence Society Outstanding PhD Dissertation Award**

2003 – 2007 **Dr Nikos Gianniotis (primary supervisor)**
Probabilistic modelling approaches to topographic mapping of structured data

CURRENT RESEARCH STUDENTS

2024 – **Dario Barone (primary supervisor)**, *Probabilistic Modelling of Faint Structures Resulting from Interactions in the Local Galaxy Group*

2024 – **Matthew Hutchinson (primary supervisor)**, co-supervised with Dr Stephane De Brito (School of Psychology) and Dr Miriam Silver (BERRI)
Machine Learning to Support Resilient Functioning of Yong People After Childhood Maltreatment

2024 – **Ben Williamson (co-supervisor)**, co-supervised with Dr Nicole Wheeler
Detection of Potentially Malicious Functional Traits on Genetic Sequences

2020 – **Shanshan Mao (primary supervisor)**, *Emergence of Hierarchies in Swarm Colonies*

2022 – **Tamsin James (co-supervisor)**, co-supervised with Dr Nicole Wheeler
Mining Functional Traits in Graph Representations of Genetic Sequences

2022 – **Anthony Lee (primary supervisor)**, co-supervised with Prof Iain Styles
Learning in the Space of Process Mining Models

2021 – **Janis Norden (co-supervisor)**, co-supervised with Dr Kerstin Bunte (Groningen University, NL)
Learning in the space of mechanistic ODE models

2021 – **Elisa Oostwal (co-supervisor)**, co-supervised with Dr Kerstin Bunte (Groningen University, NL)
Learning in the space of mechanistic ODE models

RESEARCH FELLOWS

2022-2024 **Dr. Marco Canducci (primary supervisor)**
Funded by **National Institute for Health and Care Research (NIHR)**
OPTIMising therapies, discovering therapeutic targets and AI assisted clinical management for patients Living with complex multimorbidity (OPTIMAL study)

2021 **Dr. Simon Fong (primary supervisor)**
Funded by **Alan Turing Institute**, Peter Tiňo's Alan Turing Institute Fellowship
Machine Learning in the Space of State-Space Dynamic Models
Current position: Huawei, Hong Kong

2021 **Dr. Marco Canducci (primary supervisor)**
Funded by **Alan Turing Institute**, Peter Tiňo's Alan Turing Institute Fellowship
Machine Learning for Calibration and Analysis of Astrophysical Simulations

2016 – 2018 **Dr. Siang Yew Chong (primary supervisor)**
Funded by **EU Horizon 2020**, Marie Skłodowska-Curie Individual Fellowship
Unified Framework for the Analysis of Co-evolutionary Systems
Current position: Associate Professor at the University of Nottingham, Malaysia campus

2015 – 2016 **Dr. Kerstin Bunte (primary supervisor)**
Funded by **EU Horizon 2020**, Marie Skłodowska-Curie Individual Fellowship
Learning in the Space of Dynamical Models of Adrenal Steroidogenesis
Current position: Associate Professor (Rosalind Franklin Fellow, tenure track), Johann Bernoulli Institute for Mathematics and Computer Science, University of Groningen, Holland

2014 – 2016 **Prof. Frank Schleif (primary supervisor)**
Funded by **EU FP7**, Marie-Curie Intra-European Fellow
Probabilistic Models in Pseudo-Euclidean Spaces
Current position: Professor of Database management and Business Intelligence, University of Applied Sciences, Wuerzburg-Schweinfurt, Germany

2014 **Dr. Shereen Fouad (primary supervisor)**
Funded by **BBSRC**
Brain Imaging Data as Privileged Information in Machine Learning on Cognitive Data
Current position: Lecturer, Aston University, UK

2014 –2017 **Dr. Yuan Shen (primary supervisor)**
Funded by **EPSRC**
Personalised Health Care Through Learning in the Model Space
Current position: Senior Research Fellow, Nottingham Trent University, UK

2011 –2013	**Dr. Yuan Shen (primary supervisor)** Funded by **BBSRC** *Spatial Mixtures of Temporal Hidden Process Models for fMRI Data* Current position: Senior Research Fellow, Nottingham Trent University, UK
2011 – 2013	**Dr. Huanhuan Chen (co-supervisor)**, co-supervised with Prof Xin Yao, co-supervisor Funded by **EU FP7** *Learning in the Model Space for Fault Diagnosis* Current position: Professor of Computer Science at School of Computer Science, Professor at University of Science and Technology of China, China
2004 – 2007	**Dr. Jianyong Sun (co-supervisor)**, co-supervised with Dr Somak Raychaudhury and Dr Ata Kabán Funded by **PPARC** *Topographic Mapping of Multi-Modal Galaxy Data* Current position: Lecturer at Xi'an Jiaotong University, China

Teaching Related Administration

EXTERNAL EXAMINATION OF DEGREE PROGRAMMES

2013 – 2016	**Keele University, School of Computing and Mathematics** **External examiner** for **undergraduate programmes in computing**.
2010	**University of Newcastle - School of Computing Science** **External advisor** evaluating a proposal for **4 year MComp** (Master of Computer Science undergraduate degree = 3+1 year) **with option of study abroad**.

HOME INSTITUTION (selected)

09/2019 –	**Director and admissions tutor of MSc in AI and Machine Learning**
02/2016 – 09/2018	**Director of Undergraduate Studies**
08/2009 – 09/2013	**Director of Undergraduate Studies**
03/2010 – 03/2012	**EPS College Programme and Modules Approval Group (PMAG)** for reviewing and approval of new modules and programmes (or module/programme modifications) within the EPS college.
08/2005 – 07/2009	**Final Year Projects Manager**

Knowledge Exchange and Widening Participation

KNOWLEDGE TRANSFER

06/2011 – 12/2011 **Supplies Group Ltd - Estimation of customer life time value**
- Developed within **Industrial Mathematics shorter KTP**.
- **Shortlisted for Founders' Award for Excellence in Business Advancement**.

WIDENING PARTICIPATION (selected)

06/2017, 06/2018 **Lectures** on **Probabilistic Modelling in Machine Learning** at the **Research Summer School on Statistics for Data Science (S4D)**, Caen, France

12/07/2015 **Tutorial** on **Dynamic Systems and Learning in the Model Space**
International Joint Conference on Neural Networks (**IJCNN 2015**), Killarney, Ireland (with Prof Huanhuan Chen, University of Science and Technology of China)

12/07/2015 **Tutorial** on **Learning in Indefinite Proximity Spaces: Mathematical Foundations, Representations, and Model**
International Joint Conference on Neural Networks (**IJCNN 2015**), Killarney, Ireland (with Dr Frank Schleif, Birmingham University)

10/06/2012 **Tutorial** on **Theory and Practice of State Space Models**
International Joint Conference on Neural Networks (**IJCNN 2012**), Brisbane, Australia (with Dr Yuan Shen, Birmingham University)

31/07/2011 **Tutorial** on **Ensemble Modelling**
International Joint Conference on Neural Networks (**IJCNN 2011**), San Jose, USA
Organized with Prof Xin Yao and Dr Huahuan Chen, Birmingham University

2003 – 2011 **Regular lectures** at the **annual International British Computer Society Summer School on Pattern Recognition**
- Exeter 2003
- Plymouth 2004, 2005, 2006, 2007, 2009, 2010, 2011

Citizenship

PROFESSIONAL ORGANISATIONS

03/2020 – 01/2021 **Chair** of **Task Force on "Mining Complex Astronomical Data"** under the **IEEE CIS Data Mining Technical Committee**

10/2018 – **Member** of **IEEE Task Force on Reservoir Computing** under the **IEEE CIS Data Mining and Big Data Analytics Technical Committee**

04/2014 – 02/2020 **Co-Chair** of **Task Force on "Mining Complex Astronomical Data"** under the **IEEE CIS Data Mining Technical Committee**

2013 – 2016 **Vice Chair** of **Neural Networks Technical Committee of the IEEE Computational Intelligence Society**

02/2012 – 02/2016	**Member** of **Subcommittee on Research Grants of the IEEE Computational Intelligence Society**
04/2010 –	**Member** of **Technical Committee on Computational Life Science of the IEEE Systems Man and Cybernetics Society**
04/2010 –	**Member** of **Task force on 'Data Visualization and Data Analysis' of the Technical Committee on Data Mining of IEEE Computational Intelligence Society**

PANEL MEETINGS OF FUNDING BODIES

2014	**EPSRC** - Engineering and Physical Sciences Research Council (UK)
2014	**NWO** - Netherlands Organisation for Scientific Research (Netherlands)
2025	**RGC** - Research Grant Council, Hong Kong

ORGANISATION AND MANAGEMENT OF SCIENTIFIC EVENTS (selected)

- **Programme Committee Member** of $\approx$ **100 international conferences**
- **Programme Chair** - **IJCNN 2026** (International Joint Conference on Neural Networks)
- **General Chair** - **IDEAL 2021, 2019** (International Conference on Intelligent Data Engineering and Automated Learning)
- **Senior Programme Committee Member** - **IJCAI 2015** (International Joint Conference on Artificial Intelligence)
- **Area Programme Committee Chair** - **ICANN 2011** (International Conference on Artificial Neural Networks)

SPECIAL SESSIONS AT INTERNATIONAL CONFERENCES (selected)

2018	Special session on **Machine Learning and Data Analysis in Astroinformatics** European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2018**), Bruges, Belgium. Organized with Prof. Michael Biehl and Dr Kerstin Bunte, University of Groningen, and Prof. Giuseppe Longo, University of Naples.
2018	Special session on **Randomized Neural Networks** European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2018**), Bruges, Belgium. Organized with Dr. Claudio Gallicchio and Dr Alessio Micheli, University of Pisa.
2016	Special session on **Indefinite proximity learning** European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2016**), Bruges, Belgium. Organized with Dr. Frank Schleif, Birmingham University and Yingyu Liang, Princeton University.

2014	Special session on **Learning of structured and non-standard data** European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2014**), Bruges, Belgium. Organized with Dr. Frank Schleif, Birmingham University and Prof Thomas Willmann, Mittweida.
2012	Special session on **Data Regularisation, Fault and Anomaly Detection, Isolation and Mitigation** The 2012 IEEE World Congress on Computational Intelligence **(IEEE WCCI 2012)**, Brisbane, Australia. Organized with Dr Huanhuan Chen, Birmingham University and Prof Xin Yao, Birmingham University.
2012	Special session on **Theory and Practice of Adaptive Input Driven Dynamical Systems** European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (**ESANN 2012**), Bruges, Belgium. Organized with Prof Jochen Steil, Bielefeld University and Dr Manjunath Gandhi, Jacobs University.
2010	Special session on **Reservoir Computation** International Joint Conference on Neural Networks (**IJCNN 2010**), Barcelona, Spain. Organized with Dr Pedro Antonio Gutiérrez Peña, University of Cordoba.

EXTERNAL EXAMINATION OF DOCTORAL THESIS

- **University of Exeter**, UK (2021)
- **Imperial College, London**, UK (2017)
- **University of Manchester**, UK (2015, 2019, 2020)
- **University of Reading**, UK (2015)
- **University of Granada**, Spain (2013)
- **University of Cordoba**, Spain (2019)
- **University of Warwick**, UK (2013, 2014, 2018)
- **Gent University**, Belgium (2012)
- **Pisa University**, Italy (2011, 2021)
- **Bielefeld University**, Germany (2011, 2017)
- **University of Groningen**, Netherlands (2010)
- **Aston University**, UK (2010, 2014, 2020)
- **University of Edinburgh**, UK (2009)
- **Aberystwyth University**, UK (2009)
- **University of the West of Scotland**, UK (2008)

- **University of Southampton**, UK (2008)
- **University of Surrey**, UK (2005, 2007)
- **University of Queensland**, Australia (2007)
- **Sheffield University**, UK (2006)

HOSTING VISITING RESEARCHERS

05/09/2019 – 20/12/2019 **Mr. Pietro Verzelli**, Universita della Svizzera Italiana, Switzerland

29/11/2019 – 14/12/2019 **Dr. Fengzhen Tang**, Chinese Academy of Sciences, China

22/07/2019 – 22/10/2019 **Mr. Daniel Gonzalez Bandala**, University of San Luis Potosi, Mexico

03/11/2018 – 16/11/2018 **Dr. Fengzhen Tang**, Chinese Academy of Sciences, China

28/02/2018 – 01/06/2018 **Mr Antonio M. Durán Rosal**, University of Cordoba, Spain

01/02/2018 – 28/02/2018 **Mr Maruf Hossain**, University of Tokyo, Japan

01/02/2017 – 01/05/2017 **Dr Maria Pérez**, University of Cordoba, Spain

07/03/2016 – 18/03/2016 **Mr Luca Pasa**, University of Padova, Italy

01/04/2016 – 01/04/2017 **Dr Tugba Temizel**, Middle East Technical University, Turkey

16/07/2014 – 24/07/2014 **Mr. Andrej Gisbrecht**, Bielefeld University, Germany

01/05/2013 – 30/07/2013 **Miss Maria Pérez**, University of Cordoba, Spain

01/05/2013 – 30/07/2013 **Dr. Juan Cuevas-Tello**, University of San Luis Potosi, Mexico

18/06/2012 – 28/06/2012 **Dr. Felix Reinhart**, Bielefeld University, Germany

15/07/2012 – 29/07/2012 **Dr. Frank-Michael Schleif**, Bielefeld University, Germany

13/02/2012 – 31/01/2013 **Dr. Jubo Zhao**, Beijing Institute of Radio Measurement, China

15/07/2012 – 29/07/2012 **Mr. Andrej Gisbrecht**, Bielefeld University, Germany

01/07/2011 – 01/10/2011 **Dr. Pedro Antonio Gutiérrez Peña**, University of Cordoba, Spain

27/09/2011 – 20/09/2012 **Miss Jun Wu**, Wu Han University of Technology, China

26/09/2011 – 20/12/2011 **Dr. Javier Sanchez Monedero**, University of Cordoba, Spain

09/04/2010 – 31/03/2011 **Prof. Xiaoning Peng**, Huaihua University, China

05/07/2010 – 04/08/2010 **Dr. Jana Švehlíková**, Slovak Academy of Sciences, Slovak Republics

05/07/2010 – 19/08/2010 **Dr. Maria Markošová**, Comenius University, Slovak Republic

02/06/2009 – 28/06/2009 **Dr. Juan Cuevas-Tello**, University of San Luis Potosi, Mexico

15/09/2009 – 15/12/2009 **Dr. Pedro Antonio Gutiérrez Peña**, University of Cordoba

15/07/2008 – 08/08/2008 **Dr. Mikael Bodén**, University of Queensland, Australia

04/07/2006 – 29/07/2006 **Dr. Michal Čerňanský**, Slovak University of Technology, Slovak Republic

12/09/2005 – 03/10/2005 **Dr. Roman Rosípal**, Austrian Research Institute for AI, Austria

11/05/2005 – 10/06/2005 **Dr. Whitney Tabor**, University of Connecticut, USA

05/07/2004 – 27/07/2004 **Dr. Igor Farkaš**, Comenius University, Slovak Republic

08/09/2003 – 29/09/2003 **Prof. Barbara Hammer**, University of Osnabrueck, Germany

REVIEW SERVICE

- **Journals** including:
  - IEEE Transactions on Pattern Analysis and Machine Intelligence
  - IEEE Transactions on Neural Networks and Learning Systems
  - IEEE Transactions on Evolutionary Computation
  - PLOS ONE
  - Journal of Machine Learning Research
  - Physica D: Nonlinear Phenomena
  - Quantitative Finance
  - Machine Learning
  - IEEE Transactions on Signal Processing
  - Nonlinearity
  - Neural Computation
  - Neural Networks
  - Bioinformatics
  - Artificial Intelligence

- **Reviewer of grant proposals** for
  - ERC
  - EPSRC (UK)
  - BBSRC (UK)
  - MRC (UK) - NSERC (Canada)
  - AXA Research Fund (France)
  - Flanders Research Foundation (Belgium)
  - NWO (Netherlands Organisation for Scientific Research)
  - ISF (Israel Science Foundation)