Curriculum Vitae

Personal information

Full Name and Title: Professor Peter Emil Andras
Office address: School of Computing, Engineering and the Built Environment, Edinburgh Napier University, EH10 5DT, Edinburgh, Scotland, UK
Contact information: +44-131-4552456 (office), +44-7799-424143 (mobile), p.andras@napier.ac.uk

Main Appointments – in reverse chronological order

- Dean, School of Computing, Engineering & the Built Environment, Edinburgh Napier University, since August 2021.
- Professor of Computer Science, Edinburgh Napier University, since August 2021.
- Head of School, School of Computing and Mathematics, Keele University, Sept 2017 – Jul 2021.
- Professor of Computer Science and Informatics, Keele University, Jul 2014 – Jul 2021.
- Associate Professor (Reader) in Complex Systems and Computational Intelligence, Newcastle University, Aug 2005 – Jun 2014.
- Assistant Professor (Lecturer), School of Computing Science, Newcastle University, Aug 2002 – Jul 2005.
- Assistant Professor (Lecturer), Department of Psychology, Newcastle University, Oct 2001 – Jul 2002.

Key Education / Qualifications

- PhD, Mathematical Analysis of Neural Networks, Babes-Bolyai University, Cluj, Romania, May 2000.
- MSc, Artificial Intelligence, Babes-Bolyai University, Cluj, Romania, Jun 1996.
- BSc, Computer Science, Babes-Bolyai University, Cluj, Romania, Jun 1995.

Professional society memberships and recognition

International Neural Network Society (INNS) – **Member of the Board of Governors** (since Jan 2020), Institute of Electronic and Electrical Engineers (IEEE) – **Senior Member** (since Feb 2010), IEEE – Computer Society, Society of Biology – **Fellow** (since Dec 2011), UK Computing Research Committee, Society for Study of Artificial Intelligence and Simulation of Behaviour, Society for Neuroscience, International Society for Artificial Life. I was member of the International Exchanges Panel of the Royal Society (2016 – 2021). I was member of the Executive Committee of the European Neural Network Society (2004 – 2007). I am on the editorial board of the Neural Networks (since 2023) and Cognitive Systems Research (since 2017). I was on the editorial board of the Journal of Cognitive Neurodynamics (2006 - 2018) and Medical Hypotheses (2004 – 2010). I was a guest editor for the Journal of Integrative Neuroscience (2003). I am member of the EPSRC Peer Review College since June 2017. I have been reviewer for many research journals and UK and international funding bodies (e.g. EPSRC, BBSRC, EU H2020/Horizon Europe, FIT-IT Austria, NWO Netherlands)

Research and related funding

24 projects since 2002, funded by Medical Research Council; Engineering and Physical Sciences Research Council (EPSRC) ; Royal Academy of Engineering; Knowledge Transfer Partnership; NStar Equity Investors; Government Department for Environment, Food and Rural Affairs, Leverhulme Trust, British Council, European Research and Development Fund, with total funding of US$2.88m. I have supervised 19 PhD students (4 current) and 20 research associates. I have given 28 invited/keynote/plenary talks.

Publications

I have 167 publications to my name in total. According to the Google Scholar my publications have been cited 3,392 times, my h-index is 29, and my i10-index is 60. A few of my more important papers are:

1. Olorisade, BK, Brereton, P, Andras, P (2022). Structural complexity and performance of support vector machines. In Proceedings of the IJCNN 2022, DOI: 10.1109/IJCNN55064.2022.9892368.

2. Briggs, C, Fan, Z, Andras, P (2020). Federated learning with hierarchical clustering of local updates to improve training on non-IID data. In the Proceedings of the 2020 International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom, 2020, pp. 1-9, DOI: 10.1109/IJCNN48605.2020.9207469.
3. Andras, P (2018). High-Dimensional Function Approximation with Neural Networks for Large Volumes of Data. IEEE Transactions on Neural Networks and Learning Systems, 29: 500-508, DOI: 10.1109/TNNLS.2017.2651985
4. Andras, P, Esterle, L, Guckert, M, Han, TA, Lewis, PR, Milanovic, K, Payne, T, Perret, C, Pitt, J, Powers, ST, Urquhart, N, Wells, S (2018). Trusting Intelligent Machines – Deepening trust within socio-technical systems. IEEE Technology and Society Magazine, 37:76-83.
5. Fisher, JM, Hammerla, NY, Ploetz, T, Andras, P, Rochester, L, Walker, RW (2016). Unsupervised home monitoring of Parkinson's disease motor symptoms using body-worn accelerometers. Parkinsonism & Related Disorders, 33: 44-50.

Research highlights

My recent work on machine learning is about performance reliability in machine learning and privacy preserving federated learning. I have worked on approximation of functions defined on high-dimensional data, which is a common problem in the world of big data. My work shows how low dimensional projections of the data can improve the performance of function approximation with neural networks. I was among the first who combined kernel methods with self-organising maps to improve and extend the applicability of the latter. I introduced (in collaboration with Wolfgang Stein) the use of voltage-sensitive dye imaging to the study of the stomatogastric ganglion of crustaceans allowing the simultaneous recording of the detailed activity of many (10 – 20+) neurons which are identifiable and for which their connections and one-to-one effects are known. This is currently the only nervous system, which is relatively autonomous, with detailed knowledge of the connectivity and individual neuronal behaviour, that allows the use of multiple recording of many neurons for the analysis and computational modelling of emergent system scale behaviour. I led the technical analytic side of one of the largest scale clinical trial (32 patients) on the long-term (one week) automated assessment of the symptoms of Parkinson's Disease and the usability of body-worn accelerometer devices for this purpose. We have shown that deep learning based classification of accelerometer data can perform comparably well as trained nurses in terms of assessment of disease symptoms. Our approach allows the objective and non-intrusive assessment of patients while they are at home, which is much more reliable than the self-assessment of patients.

Patents and entrepreneurship

I am a co-founder of three spin-off companies. The e-Therapeutics Plc entered the London Stock Exchange Alternative Investment Market in November 2007. The current market capitalisation of the company is around £158m. I am co-author of 6 patents and patent applications related to the methodology and tools licensed to the e-Therapeutics Plc. I have had collaborative projects with EnviResearch Ltd, Flight Directors Ltd, Advanced Imaging Systems Ltd, XACT PCB Ltd , KBC Process Technology Ltd, Assured Systems Ltd and Bentley Motors.

Research community contributions

I have been involved in the organisation of a number of IJCNN conferences as member of the wider organising committee since 2006. I served on task groups of the INNS in the mid-2000s supporting junior researchers. I have been on the INNS Board of Governors since 2020. I have been involved in the organisation of a number of other workshops and conferences related to neural networks research. I have been on the editorial board of relevant journals, including the Neural Networks journal (since January 2023). I have acted as reviewer of many neural networks related research grant proposals in the UK, EU and elsewhere. I have advised and supported regularly junior academics and researchers working in areas related to neural networks research.