Brief Curriculum Vitae

Personal information

Name and Title: Professor Peter Andras

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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.

Main Appointments – in reverse chronological order

- Dean, School of Computing, Engineering and the Built Environment, Edinburgh Napier University, since Aug 2021
- Head of School, School of Computing and Mathematics, Keele University, Sept 2017 – Jul 2021.
- Director of Postgraduate Research, Faculty of Natural Sciences, Keele University, Jan 2016 – Sept 2017.
- Professor of Computer Science and Informatics, Keele University, from Jul 2014.
- 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.

Professional society memberships and recognition

International Neural Network Society (INNS – membership#: 1099), Institute of Electronic and Electrical Engineers (IEEE) – **Senior Member** (since 2010), IEEE – Computer Society, Society of Biology – **Fellow** (since 2011), 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 – 2022). 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 Medical Hypothesis (2004 – 2010) and Cognitive Neurodynamics (2006 – 2018). 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, FIT-IT Austria, QNRF Qatar)

Research and related funding

23 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, European Research and Development Fund, with total funding in USD: 3.57m. Recent grants:

#	Research topic/area	Funding agency	Amount (GBP)	Start & end dates
1	Machine learning applications for smart energy	ERDF	78k	07.2018-06.2021
2	Data mining for the automotive industry	KTP / Bentley Motors	248k	05.2018-04.2021
3	Expert knowledge extraction and management	KTP / KBC Process Technologies Ltd.	131k	09.2016 - 08.2018
4	Designing Novel Voltage-Sensitive Dyes for Neuroscience Research	Leverhulme Trust	178k	08.2015 - 01.2018

I have supervised 25 PhD students (3 current) and 21 research associates and technicians.

Publications

I have 177 publications in total. According to the Google Scholar my publications were cited 4,549 times, my h-index is 31, and my i10-index is 64. Relevant papers:

1. Bentick, K, Runevic, J, Akula, S, Kyriacou, T, Cool P, **Andras, P** (2023). Machine learning models based on routinely sampled blood tests can predict the presence of malignancy amongst patients with suspected musculoskeletal malignancy. Methods, 220:55-60.
2. **Andras, P** (2022). Structural Complexity and Performance of Support Vector Machines. In the proceedings of the 2022 International Joint Conference on Neural Networks, DOI: 10.1109/IJCNN55064.2022.9892368
3. 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.
4. **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.
5. **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. Accepted for publication in the IEEE Technology and Society Magazine.
6. Steyn, JS, **Andras, P** (2017). Analysis of the dynamics of temporal relationships of neural activities using optical imaging data. Journal of Computational Neuroscience, 42: 107-121.
7. Luo, L, Nikolic, P, Evans, B, **Andras, P**, Yakovlev, A, Degenaar, P (2017). Optogenetics in silicon: a neural processor for predicting optically active neural networks. IEEE Transactions on Biomedical Circuits and Systems, 11: 15-27.
8. 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 work on machine learning covers several topics. Most recently I 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 (2018) the only nervous system, which is relatively autonomous (with one spontaneous activity rhythm), with detailed knowledge of the connectivity and individual neuronal behaviour, that allows the use of multiple recording of many neurons for the purpose of the analysis of the emergent network and system level behaviour in neural systems.

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 was on the London Stock Exchange (AIM) from 2007 – 2024 and is planning to relist on the NASDAQ in the coming years. The current market capitalisation of the company is around USD 74.3m. I am co-author of 6 patents and patent applications related to the methodology and tools licensed to the e-Therapeutics Plc.