PERSONAL INFORMATION

Full name: Pieter Adriaan Flach
Date of birth: 8 April 1961
Nationality: Netherlands
ORCID: 0000-0001-6857-5810

EDUCATION

1995   PhD in Computer Science (*cum laude*), Tilburg University, the Netherlands
1987   MSc in Electrical Engineering (*cum laude*), Twente University, the Netherlands

CURRENT AND PREVIOUS POSITIONS

2003 – now   Professor of Artificial Intelligence, University of Bristol, UK
2010 – now   Editor-in-Chief, *Machine Learning*, published by Springer Nature
2000 – 2003   Reader in Machine Learning, University of Bristol, UK
1997 – 2000   Lecturer in Computer Science, University of Bristol, UK
1988 – 1997   Assistant Professor in Computer Science, University of Tilburg, Netherlands
1987 – 1988   Scientific Researcher, Philips Research Laboratories Eindhoven, Netherlands

SHORT BIO

Peter Flach is Professor of Artificial Intelligence at the University of Bristol. An internationally leading researcher in the areas of mining highly structured data and the evaluation and improvement of machine learning models using ROC analysis and classifier calibration, he has also published on the logic and philosophy of machine learning, and on the methodology of data science. He is author of *Simply Logical: Intelligent Reasoning by Example* (John Wiley, 1994) and *Machine Learning: the Art and Science of Algorithms that Make Sense of Data* (Cambridge University Press, 2012), which has, to date, sold over 13,000 copies and has established itself as a key reference in machine learning with translations into Russian, Mandarin and Japanese.

MAJOR ROLES OF RESPONSIBILITY AND SERVICE TO THE COMMUNITY

Prof Flach is the Editor-in-Chief of the *Machine Learning* journal, one of the two top journals in the field which has been published for over 30 years by Kluwer and now Springer Nature. He was Programme Co-Chair of the 1999 *International Conference on Inductive Logic Programming*, the 2001 *European Conference on Machine Learning*, the 2009 *ACM Conference on Knowledge Discovery and Data Mining* (KDD'09), and the 2012 *European Conference on Machine Learning and Knowledge Discovery in Databases* in Bristol. He is a founding board member of the recently established *European Association for Data Science* (EuADS.org).

PUBLICATIONS

Prof Flach's current Google Scholar profile lists more than 250 publications that have accumulated over 9,000 citations and a Hirsch-index of 47 (March 2018). He publishes regularly in the main machine learning, data mining and artificial intelligence conferences, including ACM SIGKDD, AISTATS, ECAI, ECML-PKDD, ICDM, IJCAI, NIPS (all in the past three years).

Ten most highly-cited papers:

1. *On graph kernels: Hardness results and efficient alternatives*. T Gärtner, **P Flach**, S Wrobel. COLT'03 (671 citations)
2. *Multi-Instance Kernels*. T Gärtner, **P Flach**, A Kowalczyk, AJ Smola. ICML'02 (475 citations)
3. *Rule evaluation measures: A unifying view*. N Lavrač, **P Flach**, B Zupan. ILP'99 (457 citations)
4. *Machine learning: the art and science of algorithms that make sense of data*. **P Flach**. Cambridge University Press, 2012 (404 citations)
5. *Subgroup discovery with CN2-SD*. N Lavrač, B Kavšek, **P Flach**, L Todorovski. *Journal of Machine Learning Research* 5: 153-188, 2004 (375 citations)
6. *Propositionalization approaches to relational data mining*. S Kramer, N Lavrač, **P Flach**. In *Relational data mining*, pp.262-291, 2001 (322 citations)
7. *Learning decision trees using the area under the ROC curve*. C Ferri, **P Flach**, J Hernández-Orallo. ICML'02 (319 citations)
8. *The geometry of ROC space: understanding machine learning metrics through ROC isometrics*. **P Flach**. ICML'03 (265 citations)
9. *Roc 'n' rule learning—towards a better understanding of covering algorithms*. J Fürnkranz, **P Flach**. *Machine Learning* 58(1):39-77, 2005 (236 citations)
10. *Abduction and Induction: Essays on their relation and integration*. **P Flach**, AC Kakas (eds.). Kluwer Academic Publishers, 2000 (229 citations)

Selected recent journal papers:

1. *Computational Support for Academic Peer Review: A Perspective from Artificial Intelligence*. S Price, **P Flach**. *Communications of the ACM* 60(3):70-79, 2017.
2. *Unsupervised Learning of Sensor Topologies for Improving Activity Recognition in Smart Environments*. N Twomey, T Diethe, **P Flach**, I Craddock. *Neurocomputing* 234:93-106, 2017.
3. *Beyond sigmoids: How to obtain well-calibrated probabilities from binary classifiers with beta calibration*. M Kull, T Silva Filho, **P Flach**. *Electronic Journal of Statistics* 11(2):5052-5080, 2017.
4. *Smart homes, private homes? An empirical study of technology researchers' perceptions of ethical issues in developing smart home health technologies*. G Birchley, R Huxtable, M Murtagh, R ter Meulen, **P Flach**, R Gooberman-Hill. *BMC medical ethics* 18(23):1-13, 2017.
5. *Physical activity phenotyping with activity bigrams, and their association with BMI*. LAC Millard, K Tilling, DA Lawlor, **P Flach**, T Gaunt. *International Journal of Epidemiology* 46(6):1857-1870, 2017.
6. *Reframing in context: A systematic approach for model reuse in machine learning*. J Hernández-Orallo, A Martínez-Usó, R Prudêncio, M Kull, **P Flach**, CF Ahmed, N Lachiche. *AI Communications* 29(5):551-566, 2016.
7. *Cost-sensitive boosting algorithms: Do we really need them?* N Nikolaou, N Edakunni, M Kull, **P Flach**, G Brown. *Machine Learning* 104(2-3):359-384, 2016.
8. *On the need for structure modelling in sequence prediction*. N Twomey, T Diethe, **P Flach**. *Machine Learning* 104(2-3):291-314, 2016.
9. *Feature Construction and Calibration for Clustering Daily Load Curves from Smart-Meter Data*. R Al-Otaibi, N Jin, T Wilcox, **P Flach**. *IEEE Trans. Industrial Informatics* 12(2):645-654, 2016.
10. *Machine learning to assist risk-of-bias assessments in systematic reviews*. LAC Millard, **P Flach**, JPT Higgins. *International Journal of Epidemiology* 45(1):266-277, 2015.
11. *Bridging e-health and the internet of things: The SPHERE project*. N Zhu, T Diethe, M Camplani, L Tao, A Burrows, N Twomey, D Kaleshi, M Mirmehdi, **P Flach**, I Craddock. *IEEE Intelligent Systems* 30(4):39-46, 2015.

TEACHING

Prof Flach has been teaching since 1988 on a wide range of computer science courses. Current teaching includes machine learning, artificial intelligence and data science courses to advanced undergraduates and MSc students.

INSTITUTIONAL AND INTRA-INSTITUTIONAL RESPONSIBILITIES

These include course director of several undergraduate and MSc courses; senior tutor and year tutor; departmental research director; academic lead of one of the University's research themes (Exabyte Informatics); founding board member of the Jean Golding institute for applied data science. For the last five years Prof Flach has chaired the University's Research Data Storage and Management Executive, where he was instrumental in setting up the University's Research Data Storage Facility and associated governance structure. Responsibilities at other institutions include being external examiner for MSc courses at Exeter and Imperial College, and 25 PhD examinations (both international and in the UK). Prof Flach has also been on several EPSRC and BBSRC panels and committees and has reviewed EU projects.

FUNDED RESEARCH PROJECTS

Only projects above £50k are listed. The projects marked with an asterisk are those where Prof Flach was PI or international coordinator.

1. EPSRC-funded Interdisciplinary Research Collaboration *Sensor Platform for HEalth in Residential Environments (SPHERE)*, 2013 – 2018, extended to 2021. PF leads the Data Fusion and Data Mining workpackage.
2. MRC-funded *Integrative Epidemiology Unit*, 2013 – 2018. PF co-leads the Bioinformatics and Data Mining cross-cutting theme.
3. *CHIST-ERA project *Rethinking the Essence, Flexibility and Reusability of Advanced Model Exploitation*, 2013 – 2016 (€938,577 total, €466,160 to Bristol)
4. TSB project *Generating value from smart electricity meter data*, 2011 – 2013 (£100,000)
5. *EPSRC Research Grant *Learning the morphology of complex synthetic languages*, 2006 – 2010 (£366,271)
6. Applied Research collaboration with GCHQ, 2004 – 2009 (£1,278,000 total funding for UoB, £261,000 to Computer Science)
7. *EPSRC Research Grant *Efficient first-order probabilistic models for inference and learning*, 2000 – 2003 (£51,360)
8. Framework V RTD Project 11495 *Data mining and decision support for business competitiveness*, 2000 – 2002 (2,000 KECU total funding, 175 KECU to Bristol)
9. *Esprit IV Long Term Research Project 26357 *A meta-learning assistant for providing user support in machine learning and data mining*, 1998 – 2002 (1,500 KECU total funding, 335 KECU to Bristol). PF was project coordinator from January 2001.
10. *EU-funded European Network of Excellence *ILPnet2*, 1998 - 2002 (network co-ordinator, 200 KECU total funding, 20 KECU to Bristol). The co-ordination of this network was shared between Bristol (administrative co-ordinator) and Ljubljana (scientific co-ordinator).
11. Esprit IV Long Term Research Project 20237 *Inductive Logic Programming 2*, 1996 - 1999 (associate partner, 113 KECU to Tilburg/Bristol).

POSTDOC AND PHD SUPERVISION

Seven PhD students supervised until submission; three ongoing. Eight postdocs supervised in the past, five ongoing.

PUBLIC ENGAGEMENT

The review article *Computational Support for Academic Peer Review: A Perspective from Artificial Intelligence* was selected as the cover article of the March 2017 issue of *Communications of the ACM* and accompanied by a video interview (vimeo.com/201905108).

Prof Flach appeared in the 2016 BBC4 programme The Joy of Data, going through a visualisation of the sensor data with presenter Dr Hannah Fry after her overnight stay in the SPHERE house (bbc.co.uk/programmes/b07lk6tj).

He also voiced one of the characters in an Aardman animation introducing the SPHERE project, commissioned on the occasion of the launch of the Elizabeth Blackwell Institute in 2013 (youtu.be/dsIxMBYoo84).

Prof Flach gets quoted regularly on AI and machine learning in the online popular press, here are some recent examples:

www.horizons-mag.ch/2017/06/14/are-we-being-served/

fastcompany.com/3031156

digitaltrends.com/cool-tech/sorting-algorithms-video

theage.com.au/technology/technology-news/its-the-thought-that-counts-20130831-2sxvp.html