

Professor Jonathon Hare

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Research Interests

My research interests are centred around learnt representations of data. This is a subtopic of machine learning in which machines learn to encode or embed raw data into representations (aka latent spaces or embeddings) that attempt to capture human notions of meaning and semantics, and disentangle the underlying factors that generated the data. My research necessarily incorporates research into deep neural network models ("deep learning"), as well as the more general notion of differentiable programming. Much of my research focusses on representations of visual information, and hence crosses over into the field of computer vision. I have however also worked on representations of textual information and other data modalities, and I am particularly interested in representations at the convergence of different modalities of data. At the same time, I am also highly interested in how we can take inspiration from biological systems in the design of our models, and both use this to inform new architectures, as well as to understand emergent representational properties inside those models.

Present Appointment

Current Post and Grade: Professor of Machine Learning and Computer Vision
Year of appointment to department: 2005 (Research Fellow); 2009 (Senior Research Fellow); 2012 (Lecturer)

Qualifications

2006 **PhD Computer Science**, "Saliency for Image Description and Retrieval". University of Southampton. *Co-funded by EPSRC and Motorola.*

2002 **BEng (First Class Honours) Aerospace Engineering (Systems)**, University of Southampton.

PhD Student Supervision

Currently supervising 10 PhD students. 14 completed.

Prizes (selected for brevity)

Vice Chancellors Teaching Award for excellence in teaching, 2015.

Vice Chancellors Award for outreach, 2014.

Excellence in Teaching Award for **innovative teaching** in the faculty, 2014.

ACM Multimedia 2011 Open-Source Competition Winner for OpenIMAJ and ImageTerrier, 2011.

External Research grants and contracts (selected for brevity)

Dates	Award holder(s)	Funding body	Title	Value
2020-2021	Fraser Sturt & self	UKSA (SPRINT)	ArchAI SPRINT	£50k
2020-	Geoff Merrett & Self	EPSRC	Centre for Spatial Computational Learning	£1.2M
10/2018-05/2020	Self	Innovate UK	TranscribeAI	£664k
4/2015 - 4/2016	Self & P Atkinson	Ordnance Survey	ImageLearn	£100k
2013	Self	EPSRC Semantic Media Network	SemanticNews	£37k

Distinguished Lectures

04/2014 "Mining Events from Multimedia Streams", **keynote talk for the ACM ICMR 2014 Workshop on Social Events in Web Multimedia.**

10/2006 "The art and science of image retrieval", for the **Royal Institution.**

Invited Talks

- 07/2022 “Understanding Sketch Images by Differentiably Modelling Image Generation”, **University of Glasgow.**
- 03/2012 “Sharp Images and Fuzzy Concepts: Multimedia Retrieval and the Semantic Gap”, **Southampton University IEEE Student Branch.**
- 03/2011 “Searching Images: Recent research at Southampton”, **KMi, Open University.**
- 02/2011 “Searching Images: Recent research at Southampton”, **University of Glasgow.**
- 06/2008 “Semantic Spaces for Music Recommendations”, **BBC A&MI.**
- 05/2006 “Saliency for Image Description and Retrieval”, **University of Brighton.**

Publication Summary

Journal papers: >25 (inc: Neural Computation, JAIR, TNNLS, RSE, etc)

Book chapters: 3

Conference Papers: >80 refereed (in top conferences, including multiple papers in **NeurIPS** and **ICLR**, as well as IEEE FG, IEE BTAS, NAACL, ACMMM, ACM SIGIR, etc)

Bibliometrics: Google Scholar citations: 3606, h-index: 28, i-10 index: 58

Patents (grants; applications not shown for brevity)

Sargent, I, and **Hare, J. S.** (Filed 2017, Granted 2020; **in force**) Topographic Data Machine Learning Method and System. US Patent 10,586,103

Hobson, P. M., **Hare, J. S.** (Filed 2001; Published 2002; Granted 2003; NIF 2008) Video/image communication with watermarking. **UK Patents GB2377107, GB2377108, GB2377109.**

Hare, J. S., Hobson, P. M., Dolbear, C. M. (Filed 2001; Published 2003; Granted 2003; **in force**) Tamper detection for video images. **UK Patent GB2377575.**

Selected Media Coverage

- 10/12/2014 “Digital Archeologists 3D Print 25-Year-Old Files”, **3D Printer World.**
- 01/04/2012 “Embracing Open Source Multimedia Software”, Media Beat column, **IEEE Multimedia April-June 2012 (vol. 19 no. 2).**
- 14/05/2008 “Solving the web’s image problem” (commentary). **BBC News.**
- 05/10/2007 “New search tool gets the picture”. **New Scientist.**
- 31/10/2006 “Phone creates interactive maps from snapshots”. **New Scientist.**

Professional Memberships:

I have active membership of the **IET**, **ACM**, the **IEEE** and the **BMVA**.

Selected Professional Activities:

Associate Editor of IET Computer Vision.

Area Chair of ACMMM 2016.

Co-organised “Knowledge extraction and consolidation from social media (KECSM)” workshop at ISWC 2012.

Co-organised the “Potential of Social Media Tools and Data for Journalists in the News Media Industry (SocMedNews)” workshop at ICSWM 2012.

Co-organised the “Symposium on Bias and Diversity in IR” at the European Summer School on Information Retrieval, Germany (2011).

Co-organised the “Semantic Image Retrieval – The User Perspective” conference in Brighton, UK (2007).

Reviewing for journals, including IEEE Transactions on Multimedia, IEEE Transactions on Knowledge and Data Engineering, Computer Vision & Image Understanding, Machine Vision and Applications, etc.

Regular PC member of international conferences including NeurIPS, ICLR (*including outstanding reviewer award 2021), CVPR, ACM Multimedia, etc.

Judging of professional competitions, including the Triplification Challenge at I-Semantics 2010 and the ACM Multimedia open source software competition 2013.