Peter Sadowski

Assistant Professor
University of Hawai'i at Mānoa
Information and Computer Science
1680 East-West Road
Honolulu, HI 96822

peter.sadowski@hawaii.edu
https://www2.hawaii.edu/~psadow
+1 (808) 956-2023

Education

California Institute of Technology	Computer Science	B.S. with Honors 2009
University of California Irvine	Computer Science	M.S. 2013
University of California Irvine	Computer Science	Ph.D. 2016

Experience

2018–2020:	**Assistant Professor**	University of Hawai'i at Mānoa	Honolulu, HI
2016–2018:	**Postdoc**	University of California Irvine	Irvine, CA
2010–2016:	**Graduate Student**	University of California Irvine	Irvine, CA
2009–2010:	**Research Scientist**	University of Washington	Seattle, WA

Publications

Peer-reviewed journal publications

P. Baldi and P. Sadowski. Learning in the machine: Recirculation is random backpropagation. *Neural Networks*, 108:479–494, 2018

P. Baldi, P. Sadowski, and Z. Lu. Learning in the machine: Random backpropagation and the deep learning channel. *Artificial intelligence*, 260:1–35, 2018

C. Shimmin, P. Sadowski, P. Baldi, E. Weik, D. Whiteson, E. Goul, and A. Søgaard. Decorrelated jet substructure tagging using adversarial neural networks. *Phys. Rev. D*, 96:074034, Oct 2017

P. Baldi, P. Sadowski, and Z. Lu. Learning in the machine: The symmetries of the deep learning channel. *Neural Networks*, 95:110–133, 2017

P. Sadowski, B. Radics, Ananya, Y. Yamazaki, and P. Baldi. Efficient antihydrogen detection in antimatter physics by deep learning. *Journal of Physics Communications*, 1(2):025001, 2017

P. Sadowski, D. Fooshee, N. Subrahmanya, and P. Baldi. Synergies between quantum mechanics and machine learning in reaction prediction. *Journal of chemical information and modeling*, 56(11):2125–2128, 2016

P. Baldi and P. Sadowski. A theory of local learning, the learning channel, and the optimality of backpropagation. *Neural Networks*, 83:51–74, 2016

P. Baldi, K. Bauer, C. Eng, P. Sadowski, and D. Whiteson. Jet substructure classification in high-energy physics with deep neural networks. *Phys. Rev. D*, 93:094034, May 2016

P. Baldi, K. Cranmer, T. Faucett, P. Sadowski, and D. Whiteson. Parameterized neural networks for high-energy physics. *The European Physical Journal C*, 76(5):235, 2016

P. Baldi, P. Sadowski, and D. Whiteson. Enhanced higgs boson to $\tau^+ \tau^-$ search with deep learning. *Phys. Rev. Letters*, 114:111801, 2015

P. Baldi, P. Sadowski, and D. Whiteson. Searching for exotic particles in high-energy physics with deep learning. *Nature Communications*, 5, 2014

P. Sadowski and P. Baldi. Small-molecule 3d structure prediction using open crystallography data. *Journal of chemical information and modeling*, 53(12):3127–3130, 2013

Peer-reviewed conference publications

B. Quach, Y. Glaser, J. Stopa, and P. Sadowski. Deep sensing of ocean wave heights with synthetic aperture radar. In *AAAI 2020 Spring Symposium on Combining Artificial Intelligence and MachineLearning with Physical Sciences*, 2020

A. Nikolaev, I. Richter, and P. Sadowski. Deep learning for climate models of the atlantic ocean,. In *AAAI 2020 Spring Symposium on Combining Artificial Intelligence and MachineLearning with Physical Sciences*, 2020

E. Racah, S. Ko, P. Sadowski, W. Bhimji, C. Tull, S.-Y. Oh, P. Baldi, et al. Revealing fundamental physics from the daya bay neutrino experiment using deep neural networks. In *2016 15th IEEE International Conference on Machine Learning and Applications (ICMLA)*, pages 892–897. IEEE, 2016

P. Sadowski, J. Collado, D. Whiteson, and P. Baldi. Deep learning, dark knowledge, and dark matter. In *NIPS 2014 Workshop on High-energy Physics and Machine Learning*, pages 81–87, 2015

D. Chicco, P. Sadowski, and P. Baldi. Deep autoencoder neural networks for gene ontology annotation predictions. In *Proceedings of the 5th ACM conference on bioinformatics, computational biology, and health informatics*, pages 533–540, 2014

P. J. Sadowski, D. Whiteson, and P. Baldi. Searching for higgs boson decay modes with deep learning. In *Advances in Neural Information Processing Systems*, pages 2393–2401, 2014

P. Baldi and P. Sadowski. Understanding dropout. In *Advances in neural information processing systems*, pages 2814–2822, 2013

P. Sadowski, L. Cazzanti, and M. R. Gupta. Bayesian and pairwise local similarity discriminant analysis. In *2010 2nd International Workshop on Cognitive Information Processing*, pages 287–292. IEEE, 2010

Book chapters

P. Sadowski and P. Baldi. Deep learning in the natural sciences: applications to physics. In *Braverman Readings in Machine Learning. Key Ideas from Inception to Current State*, pages 269–297. Springer, 2018

Other publications

R. Beck, P. Sadowski, Y. Glaser, and I. Szapudi. Refined redshift regression in cosmology with graph convolution networks. In *NeurIPS Machine Learning and the Physical Sciences Workshop*. 2019

C. Dodds, I. Cunnyngham, L. Tarr, S. Jaeggli, T. Schadd, P. Sadowski, and X. Sun. Inverting solar spectropolarimetric observations with deep learning. In *NeurIPS Machine Learning and the Physical Sciences Workshop*. 2019

R. Al-Rfou, G. Alain, A. Almahairi, C. Angermueller, D. Bahdanau, N. Ballas, F. Bastien, J. Bayer, A. Belikov, A. Belopolsky, et al. Theano: A python framework for fast computation of mathematical expressions. *arXiv preprint arXiv:1605.02688*, 2016

F. Agostinelli, M. Hoffman, P. Sadowski, and P. Baldi. Learning activation functions to improve deep neural networks. *arXiv preprint arXiv:1412.6830*, 2014

Teaching Experience

University of hawai'i at mānoa

ICS 435 Machine Learning Fundamentals	2020
ICS 235 Machine Learning Methods	2019
ICS 635 Machine Learning	2019
ICS 691 Deep Learning	2018

Other

UCI: CS172B/CS274C Neural Networks and Deep Learning (Substitute Lecturer)	2017/2018

Awards

Artificial Intelligence Journal Prominent Paper Award 2019

Research Grants

Nowcasting Solar Irradiance from Satellite Imagery, Hawaiian Electric Company, $10,000, Jan 2020 — Apr 2020, PI.

A Search for Transient Stellar Dimming in TESS FFI Lightcurves, NASA, $50,000, Oct 2019 — Oct 2020, co-investigator (PI: Eric Gaidos, UH).

Space-Feasible Body Composition and Body Shape Analysis for Long Duration Missions, Baylor College of Medicine, Oct 2019 — Oct 2020, co-investigator (PI: John Shepherd, UH Cancer Center).

Massive Hyperparameter Searches on Deep Neural Networks, Argonne National Laboratory, 10M processor hours, Aug 2017 — Aug 2018, co-investigator (PI: Pierre Baldi, UCI).

Professional Activities

Conference reviewing

Neural Information Processing Systems (NeurIPS), International Conference on Learning Representations (ICLR), International Conference on Data Mining, International Conference on Machine Learning (ICML).

Journal reviewing

Journal of Machine Learning Research (JMLR), Neural Networks, Artificial Intelligence (AIJ), Physical Review Letters (PRL), Bioinformatics, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Information Theory, Entropy, Data Mining and Knowledge Discovery, Computing and Software for Big Science, Physical Review D.

Program Committee

AAAI 2020 Spring Symposium on Combining Artificial Intelligence and Machine Learning with Physics Sciences

Talks

International Joint Conference on Artifical Intelligence — macau, china 2019

National Taiwan University — taipei, taiwan 2019

University of California Irvine — irvine, ca 2019

NeurIPS Workshop: Machine Learning Open Source Software — montreal, canada 2018

APSIPA Meeting — honolulu, hi 2018

Arizona State University — TEMPE, AZ 2018

Rice University — HOUSTON, TX 2017

IDSIA Swiss AI Lab — LUGANO, SWITZERLAND 2015

CERN Data Science Workshop — GENEVA, SWITZERLAND 2015

MANTISSA Workshop, Lawrence Berkeley National Lab — BERKELEY, CA 2015

Connecting the Dots Workshop — BERKELEY, CA 2015

ReWork Deep Learning Summit — SAN FRANCISCO, CA 2015

ACM Conf. on Bioinformatics, Comp. Bio., and Health Info. — NEWPORT BEACH, CA 2014

NIPS Workshop: Randomized Methods in ML — LAKE TAHOE, NV 2013

Systems Biology Verification Improver Symposium — LAGONISSI, GREECE 2013

PUBLIC OUTREACH TALKS

Summer Institute for Mathematics at the Univ. of Washingon — SEATTLE, WA 2014 — 2019

COSMOS Summer School for Math and Science — IRVINE, CA 2016 — 2018