Meet the Editors

CHRISTOF TEUSCHER*

Department of Electrical and Computer Engineering, Portland State University, Portland, USA



Christof Teuscher is currently the Maseeh Professor of Electrical and Computer Engineering (ECE) in the Fariborz Maseeh College of Engineering and Computer Science (MCECS) at Portland State University (PSU).

Christof first earned an electronics engineer degree in 1992. He then decided to continue his education with a Master's degree in Computer Science from the Swiss Federal Institute of Technology in Lausanne (EPFL). His Master's thesis, "Study, implementation, and evolution of the artificial neural networks proposed by Alan M. Turing. A revival of his 'schoolboy' ideas," was eventually published as a monograph by Springer in 2002 [4]. His intention was to go back to industry after completing the Master's degree, yet, he changed his mind after a summer research internship in the Logic Systems Laboratory at EPFL. The internship opened his eyes to the fascinating—and to him largely unknown—world of academic research. An opportunity to

^{*}Corresponding author: Email: teuscher@pdx.edu

present a paper at the IEEE Symposium on Field Programmable Custom Computing Machines (FCCM) sealed the deal to enroll in the PhD program at EPFL. In 2014, he earned his doctorate in computer science and obtained a postdoctoral fellowship from the Swiss government for a position at the University of California in San Diego (UCSD). In the Department of Cognitive Science at UCSD he deepened his knowledge of machine learning, connectionism, and artificial intelligence.

From 2005 to 2007, he was a Director's Postdoctoral Fellow at the Los Alamos National Laboratory (LANL) in Los Alamos, NM, USA, where he worked on next generation nano-scale architectures, self-assembled random networks, and complex and adaptive system. He later became a Technical Staff Member, but eventually decided to accept a faculty position in Electrical and Computer Engineering (ECE) at Portland State University (PSU) in 2008.

At PSU, he started his own research group that focuses on developing disruptive new computing paradigms and machines that will allow for lasting breakthroughs and open up new application domains in the next 5-20 years. The team uses a radical interdisciplinary approach and applies tools from computer science, computer engineering, physics, biology, complex systems science, and cognitive science to the study and the design of next generation computing models and architectures. The team's core expertise lies in non-classical computation, biomolecular and neuromorphic computation, machine learning and optimization techniques, computation with random systems, intrinsic computation, non-linear dynamical systems, complex and adaptive systems and networks, and large-scale simulations. Some of the work is reflected in the selected publications below: [1-3, 5-7]. The lab's website provides a more detailed overview on the current projects: http:// www.teuscher-lab.com

ACKNOWLEDGMENTS

Teuscher's research is currently supported by the National Science Foundation under grants #1028120, #1028378, #1518833, and by the Defense Advanced Research Projects Agency (DARPA) under award #HR0011-13-2-0015. The views expressed are those of the author(s) and do not reflect the official policy or position of the Department of Defense or the U.S. Government. Approved for Public Release, Distribution Unlimited.

REFERENCES

 P. Banda, C. Teuscher, and D. Stefanovic. (2014). Training an asymmetric signal perceptron through reinforcement in an artificial chemistry. *Journal of the Royal Society Interface*, 11(93):20131100.

- [2] N. J. Macias and L. J. K. Durbeck C. Teuscher. (2016). Design of introspective circuits for analysis of cell-level dis-orientation in self-assembled cellular systems. *Frontiers in Robotics and AI*, 2(3):1–13.
- [3] D. Snyder, A. Goudarzi, and C. Teuscher. (2013). Computational capabilities of random automata networks for reservoir computing. *Physical Review E*, 87(4):042808.
- [4] C. Teuscher. (September 2002). *Turing's Connectionism. An Investigation of Neural Network Architectures.* Springer-Verlag, London.
- [5] C. Teuscher. (2014). Unconventional computing catechism. *Frontiers in Robotics and AI*, 1(10).
- [6] C. Teuscher. (2017). The weird, the small, and the uncontrollable: Redefining the frontiers of computing. *Computer*. In press.
- [7] W. Woods, J. Burger, and C. Teuscher. (2015). Synaptic weight states in a locally competitive algorithm for neuromorphic memristive hardware. *IEEE Transactions on Nanotechnology*, 14:945–953.