

Guido Montufar

Short Bio:

Guido Montúfar is an Associate Professor of Mathematics and Statistics & Data Science at UCLA and Head of the Math Machine Learning Group at the Max Planck Institute for Mathematics in the Sciences. Before joining UCLA, he was a postdoctoral researcher at Penn State and MPI MiS, studied mathematics and theoretical physics at TU Berlin, and obtained the Dr.rer.nat. in 2012 as an IMPRS fellow in Leipzig. Guido Montufar is a 2022 Alfred P. Sloan Research Fellow and has received an ERC starting grant and an NSF CAREER Award. He has co-organized multiple workshops on Mathematical Machine Learning and has served as Area Chair at multiple machine learning conferences. His research considers mathematical aspects of machine learning and deep learning theory.

Topic:

Deep Learning - Parameters and Functions

The theoretical study of learning with artificial neural networks entails an ambitious program linking function parametrizations, parameter optimization procedures, and statistical generalization. The interaction between parameters, functions, and training data has implications for the optimization problem and the behavior of different parameter optimization procedures, thus influencing the types of solutions found upon training and the generalization performance. In these talks, I will cover introductory and advanced topics in learning with artificial neural networks, focusing on mathematical and statistical foundations, covering topics on data, approximation, optimization, generalization, over-parameterized models, learning regimes, algorithmic regularization, and the parameter and function space perspectives of learning.