

From Inference to Intelligence: The Evolving Role of Statistics in the Age of AI

Paulo Canas Rodrigues

Abstract

Artificial Intelligence is changing the way we analyze and use data. But behind most AI methods are core ideas from statistics: uncertainty, estimation, and learning from data. In this lecture, I will show how modern AI systems, from machine learning to generative models, build upon and sometimes challenge traditional statistical thinking. We will revisit concepts such as inference, prediction, and interpretability, and see how they appear in today's neural networks and large language models. I will also discuss why statistical reasoning is essential to make AI reliable, transparent, and fair. The goal is to open a conversation about how statistics and AI can grow together, and how statisticians can shape the future of data-driven science.

Bio: Paulo Canas Rodrigues is a Professor of Statistics and Data Science at the Federal University of Bahia and the Director of the Statistical Learning Laboratory (SaLLy; www.SaLLy.ufba.br). Paulo completed his Ph.D. in Statistics at the Nova University of Lisbon, Portugal (2012), and his Habilitation in Mathematics, with a specialization in Statistics and Stochastic Processes, at the Lisbon University, Portugal (2019). His research in time series forecasting, statistical learning, artificial intelligence, statistics, and data science resulted in more than 120 scientific papers in collaboration with more than 180 co-authors from 86 universities in 31 countries and delivered more than 200 invited talks at conferences and scientific seminars. He is an ISI Elected Member. Among other activities, he is the current President of the International Association for Statistical Computing, the Past-President of the International Society for Business and Industrial Statistics, a Member of the Representative Council of the International Biometric Society, and a Council Member of the International Statistical Institute. Website: www.paulocanas.org; www.SaLLy.ufba.br.