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Machine Learning in Python: Main Developments and Technology Trends in Data Science, Machine Learning, and Artificial Intelligence

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Discussion Research ID	DPR-2026-1141
Year	2020
Field	Computer Science
DOI	10.3390/info11040193
Author ORCID	0000-0001-6989-4493
Licence	CC-BY
Original source	Information
Permanent link	https://discussionpublishers.com/research/73d37dd2-fe32-4acd-9045-3b845e838d0b
Publisher	Discussion Publishers discussionpublishers.com

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Cite as: Sebastian Raschka, Joshua M. Patterson, Corey Nolet (2020). Machine Learning in Python: Main Developments and . Discussio

Abstract

Smarter applications are making better use of the insights gleaned from data, having an impact on every industry and research discipline. At the core of this revolution lies the tools and the methods that are driving it, from processing the massive piles of data generated each day to learning from and taking useful action. Deep neural networks, along with advancements in classical machine learning and scalable general-purpose graphics processing unit (GPU) computing, have become critical components of artificial intelligence, enabling many of these astounding breakthroughs and lowering the barrier to adoption. Python continues to be the most preferred language for scientific computing, data science, and machine learning, boosting both performance and productivity by enabling the use of low-level libraries and clean high-level APIs. This survey offers insight into the field of machine learning with Python, taking a tour through important topics to identify some of the core hardware and software paradigms that have enabled it. We cover widely-used libraries and concepts, collected together for holistic comparison, with the goal of educating the reader and driving the field of Python machine learning forward.

Keywords: Python, machine learning, data science, artificial intelligence, deep neural network, GPU computing,

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Original record: https://doi.org/10.3390/info11040193
DOI: https://doi.org/10.3390/info11040193