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OER 2.1.1

From Rule-Based Programming to Machine Learning: A Conceptual Guide for Educators

Identifier	OER 2.1.1
Title	From Rule-Based Programming to Machine Learning: A Conceptual Guide for Educators
Creator	University of Alicante - Spain
Description	A conceptual guide for teachers without a computer-science background on the historical shift from hand-written rules to systems that learn from data. It distinguishes symbolic AI, machine learning and deep learning, explaining why tacit knowledge is the bottleneck of the rule-based approach. The didactic focus is on translating the difference between the machine's probabilistic diagnosis and the teacher's docimological judgement into defensible classroom choices.
Keywords	symbolic AI; machine learning; deep learning; tacit knowledge; probabilistic diagnosis; educational assessment; AI literacy; teacher training
Language	EN (English)
Affiliation	University of Alicante - Spain
Contributor	STIAEM Transnational Scientific Board (peer review, Rhodes validation protocol)
Media Format	Text; Infographics
Genre	Training Manual; Educational Guide
URL	https://www.stiaemproject.eu/?oer_download=OER-2.1.1
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References	Cosgrove, J., & Cachia, R. (2025). DigComp 3.0: European digital competence framework (Fifth edition). Publications Office of the European Union. https://data.europa.eu/doi/10.2760/0001149 Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. Business Horizons. https://doi.org/10.1016/j.bushor.2018.08.004 Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. Science, 349(6245), 255-260. https://doi.org/10.1126/science.aaa8415 LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. Nature, 521(7553), 436-444. https://www.nature.com/articles/nature14539 Miao, F., & Cukurova, M. (2024). AI competency framework for teachers. UNESCO. https://doi.org/10.54675/ZJTE2084 Vaswani, A., Shazeer, N., Parmar, N., Uszkoreit, J., Jones, L., Gomez, A. N., Kaiser, Ł., & Polosukhin, I. (2017). Attention is all you need. Advances in Neural Information Processing Systems, 30. https://arxiv.org/abs/1706.03762
Educational Level	Secondary School
Associated Module / MOOC Video Lesson	Module 2 - AI Fundamentals and LLM Mechanics / Video 2.1 - Evolution of AI and Machine Learning

Learning Objectives	Distinguish the three major paradigms of AI - hand-written rules, machine learning, deep learning - and recognise their limits; explain why tacit knowledge is the bottleneck of the symbolic approach; translate the distinction between the machine's probabilistic diagnosis and the teacher's docimological judgement into defensible teaching choices.
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