A List of Primary Studies

Table 10. List of Selected Studies

Code	Title	Venue	Author	Year
C01	Hidden Technical Debt in Machine Learning Systems	ACM	Sculley et al.	2015
C02	An Empirical Study on Real Bugs for Machine Learning Programs	IEEE	Sun et al.	2017
C03	Is Using Deep Learning Frameworks Free? Characterising Technical Debt in Deep Learning Frameworks	ACM	Liu et al.	2020
C04	Characterizing Technical Debt and Antipatterns in AI-Based Systems: A Systematic Mapping Study	IEEE	Bogner et al.	2021
C05	An Empirical Study of Refactorings and Technical Debt in Machine Learning Systems	IEEE	Tang et al.	2021
C06	The Prevalence of Code Smells in Machine Learning Projects	ACM	Van Oort et al.	2021
C07	23 Shades of Self-Admitted Technical Debt: An Empirical Study on Machine Learning Software	ACM	O'Brien et al.	2022
P01	An Exploratory Study on the Introduction and Removal of Different Types of Technical Debt in Deep Learning Frameworks	Springer	Liu et al.	2021
P02	Self-Admitted Technical Debt in R: Detection and Causes	ACM	Sharma et al.	2022
P03	Self-Admitted Technical Debt in R Packages: An Exploratory Study	IEEE	Vidoni	2021
P04	Technical Debt in the Peer-Review Documentation of R Packages: A rOpenSci Case Study	IEEE	Codabux et al.	2021
P05	The Scent of Deep Learning Code: An Empirical Study	ACM	Jebnoun et al.	2020
P06	Silent Bugs in Deep Learning Frameworks: An Empirical Study of Keras and TensorFlow	Springer	Tambon et al.	2024
P07	Challenges in Migrating Imperative Deep Learning Programs to Graph Execution: An Empirical Study	ACM	Vélez et al.	2022
P08	Code Smells for Machine Learning Applications	ACM	Zhang et al.	2022
P09	Automatic Detection and Analysis of Technical Debts in Peer-Review Documentation of R Packages	IEEE	Khan and Uddin	2022
P10	The Symptoms, Causes, and Repairs of Bugs Inside a Deep Learning Library	Springer	Jia et al.	2021
P11	Design Smells in Deep Learning Programs: An Empirical Study	IEEE	Nikanjam et al.	2021
P12	Technical Debt in Computational Science	IEEE	Hinsen	2015
P13	The ML Test Score: A Rubric for ML Production Readiness and Technical Debt Reduction	Springer	Breck et al.	2017

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ID	Code	Title	Venue	Authors
P14	Understanding Metric-Based Detectable Smells in Python Software: A Comparative Study	ScienceDirect	Chen et al.	2019
P15	Self-Claimed Assumptions in Deep Learning Frameworks: An Exploratory Study	ACM	Yang et al.	2022
P16	Silent Bugs in Deep Learning Frameworks: An Empirical Study of Keras and TensorFlow	Springer	Tambon et al.	2024
P17	Bug Characterization in Machine Learning-Based Systems	Springer	Morovati et al.	2024
P18	A Taxonomy of Self-Admitted Technical Debt in Deep Learning Systems	ACM	Federica et al.	2024
P19	Challenges and Practices of Deep Learning Model Reengineering: A Case Study on Computer Vision	IEEE	(Author)	2024
P20	Identifying Concerns When Specifying Machine Learning-Enabled Systems: A Perspective-Based Approach	ACM	(Author)	2023
S01	Self-Admitted Technical Debt in Commit Messages: Comparing Java, Python, and R	Others	Codabux et al.	2022
S02	Do the Machine Learning Models on a Crowd Sourced Platform Exhibit Bias? An Empirical Study on Model Fairness	ACM	Biswas et al.	2020
S03	A Review on Hidden Debts in Machine Learning Systems	IEEE	2018	2018
S04	An Empirical Study of Self-Admitted Technical Debt in Machine Learning Software	ARXIV	Bhaitia et al.,	2023
S05	Detecting Code Smells in Python Programs	IEEE	Chen et al.	2016
S06	Bugs in Machine Learning-based Systems: A Faultload Benchmark	Springer	Morovati et al.	2023
S07	Technical Debt Management in Industrial ML - State of Practice and Management Model Proposal	IEEE	Wang et. Al 2023	2023
S08	Maintainability Challenges in ML: A Systematic Literature Review	IEEE	Shivashankar et. al	2022
S09	Software Engineering Challenges of Deep Learning	IEEE	Arpteg et al. 2018	2018
S10	A software engineering perspective on engineering machine learning systems: State of the art and challenges	Science Direct	Giray	2021
S11	Taxonomy of Real Faults in Deep Learning Systems	IEEE	Humbatova et. Al 2020	2021
S12	Challenges in Deploying Machine Learning: A Survey of Case Studies	ACM	2022	2022