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► **To cite this version:**

Isabelle Puaut. Machine Learning for Timing Analysis: The Good, the Bad and the Ugly. Thomas Carle. WCET 2024 - 22nd International Workshop on Worst-Case Execution Time Analysis, Jul 2024, Lille, France. Open Access Series in Informatics (OASICs), Open Access Series in Informatics (OASICs), pp.1-1, 2024, Workshop on Worst-Case Execution Time Analysis (WCET). 10.4230/OASICs.WCET.2024.7 . hal-04672502

HAL Id: hal-04672502

<https://inria.hal.science/hal-04672502v1>

Submitted on 19 Aug 2024

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Machine Learning for Timing Analysis: The Good, the Bad and the Ugly

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Abstract

The microarchitecture of processors is becoming increasingly complex and less documented, making the design of timing models for WCET calculation increasingly complicated, if not impossible. We have recently experimented with the use of machine learning techniques (ML) to predict the WCET of basic blocks [3, 1, 2, 4, 5]. Predicted WCETs can then be integrated into static WCET calculation tools, resulting in a hybrid WCET calculation.

In this keynote, we present our experience using ML for WCET calculation, across a range of architectures, from very simple ones (MSP430, Cortex M4) to more complex architectures. Rather than presenting only what worked, we also discuss in this keynote the bad, and even very bad, surprises encountered during the process, and how we overcame (most of) them.

2012 ACM Subject Classification Computer systems organization → Embedded and cyber-physical systems; Computer systems organization → Real-time systems; Computing methodologies → Machine learning

Keywords and phrases Worst-Case Execution Time (WCET) estimation, Machine Learning, Explainable ML models

Digital Object Identifier 10.4230/OASICS.WCET.2024.7

Category Invited Talk

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22nd International Workshop on Worst-Case Execution Time Analysis (WCET 2024).

Editor: Thomas Carle; Article No. 7; pp. 7:1–7:1

OpenAccess Series in Informatics



OASICS Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany