An Online Learning Approach to Hardware-Assisted Malware Detection

We check our blind spots when driving. Why not when protecting our technology?

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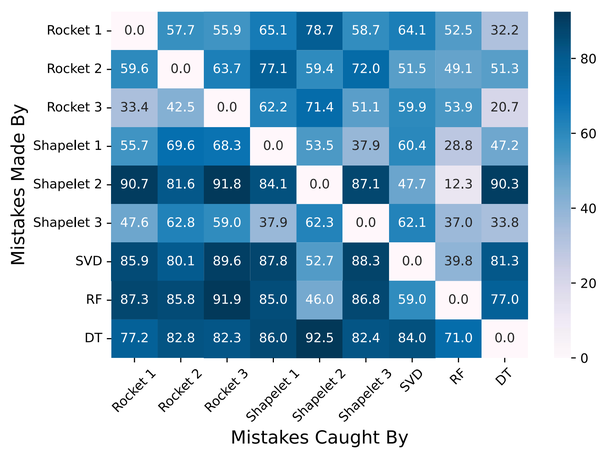
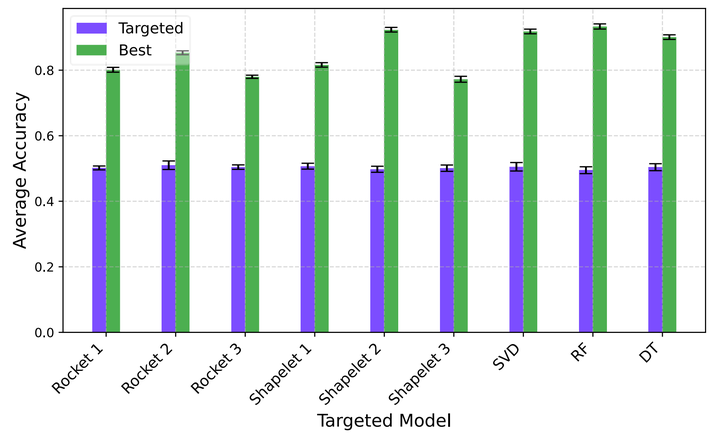
Q3 2024 saw 1,876 cyberattacks per organization every week.
Prior research looked at using hardware events to differentiate malicious from benign programs.
They construct a malware detector using ML and a subset of hardware events.

Problem

Static detectors allow attackers to exploit blind spots...



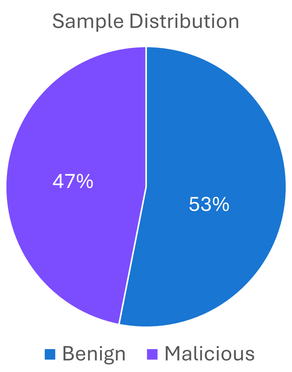
...allowing attackers to target specific detectors by learning and exploiting mistakes



Our Goal: A customizable framework that adapts to attacks in real-time.

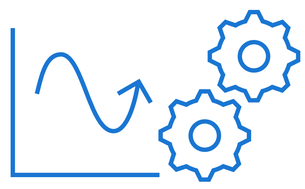
Methods

Collected 11,173 samples

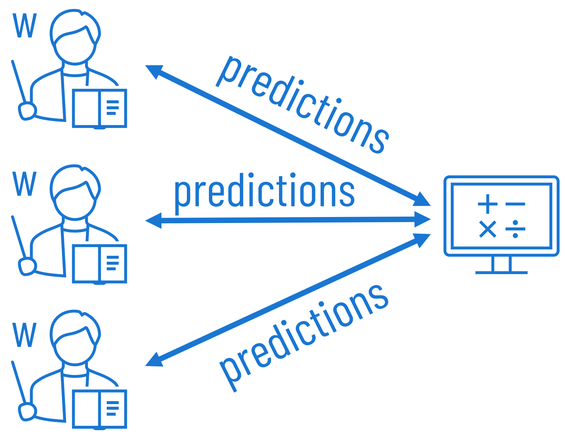


Selected hardware events

Trained models

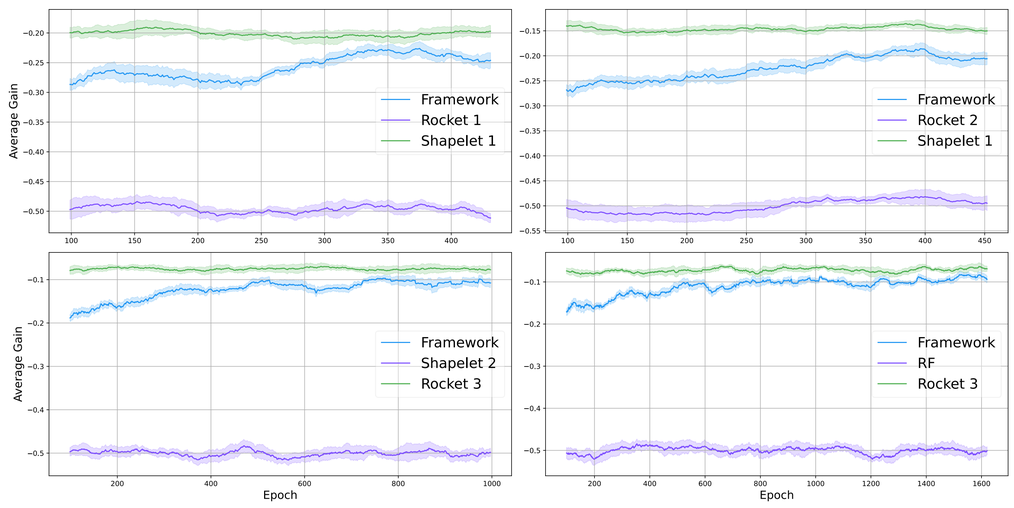


Used online learning

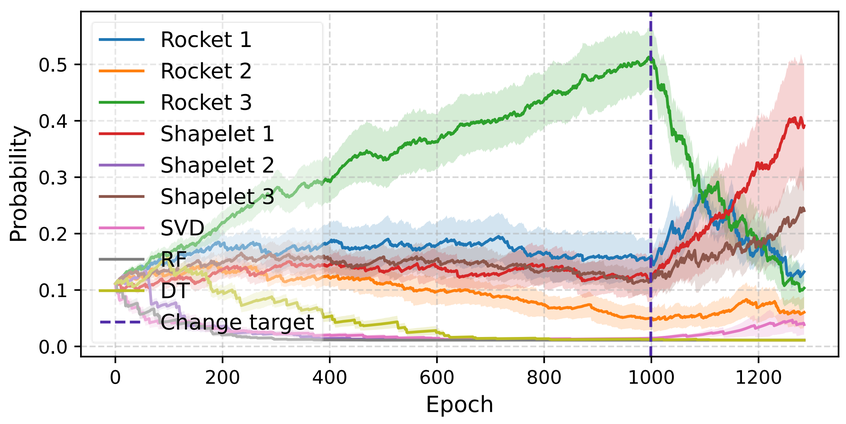


Results

Our framework's performance approaches the best static detector



And successfully adapts to changes in attack strategy



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