

Seminar

# Formal Hardware Verification - Do you trust your CPU?

Over the last years, the stream of bugs related to hardware components has not ceased. Meltdown and Spectre are just some of the most well-known examples.

As thorough testing can not guarantee the correctness of a design, another approach is becoming more interesting: Formal (proof-based) verification of hardware.

In this paper, structured insights into the concepts of formal hardware verification (eg. [1]) shall be given and a modern concept (eg. [2]) for proving the correctness of hardware according to the spec shall be explained in detail.

References:

[1] Coupet-Grimal S., Jakubiec L. (1996) Coq and hardware verification: A case study. In: Goos G., Hartmanis J., van Leeuwen J., von Wright J., Grundy J., Harrison J. (eds) Theorem Proving in Higher Order Logics. TPHOLs 1996. Lecture Notes in Computer Science, vol 1125. Springer, Berlin, Heidelberg. <https://doi.org/10.1007/BFb0105401>

[2] Joonwon Choi, Muralidaran Vijayaraghavan, Benjamin Sherman, Adam Chlipala, and Arvind. 2017. Kami: A Platform for High-Level Parametric Hardware Specification and Its Modular Verification. Proc. ACM Program. Lang. 1, ICFP, Article 24 (September 2017), 30 pages. <https://doi.org/10.1145/3110268>

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