LOCA SERIES: XiangShan: An Open-Source Project for High-Performance RISC-V Processors Meeting Industrial-Grade Standards

Abstract:

It is widely recognized that the open-source hardware ecosystem can reduce development costs and lower barrier to innovation. Within this ecosystem, developing an industrial-grade high-performance processor has thus far proven to be an elusive goal. In our view, an industrial-grade processor should involve standardized development process with robust functional and performance verification, requiring a significant upfront investment of manpower and resources. In response to the demands, we introduce XiangShan, an open-source project for high performance RISC-V processor. To the best of our knowledge, it is the world's top tier of high-performance RISC-V processor series and the only open-source option in its class. Moreover, supported by Minjie, an open-source agile development toolchain, the processors can be quickly iterated and optimized, enabling architectural innovation and rapid commercialization.

In this presentation, I will introduce the XiangShan project and the design of two generations of XiangShan, codenamed Nanhu (NH) and Kunminghu (KMH). I will also present the Minjie toolchain designed to assist developers in agile hardware design.

Speaker: Yungang Bao. Deputy Director, Institute of Computing Technology, Chinese Academy of Sciences. Chief Scientist, Beijing Institute of Open Source Chip

Short bio:
Yungang Bao is a professor of Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS) and the deputy director of ICT, CAS. Prof. Bao co-founded Beijing Institute of Open Source Chip (BOSC). His research interests include computer architecture and computer systems. He is leading the XiangShan project (https://github.com/OpenXiangShan/XiangShan), which aims to build an open-source high performance RISC-V core. He launched the One Student One Chip (OSOC) Initiative in 2019. His work was published on top conferences and journals such as ASPLOS, Communication of the ACM, HPCA, ISCA, MICRO etc. and was selected to IEEE Micro Top Picks. He was the winner of RISC-V International Technical Leadership Award, CCF-Intel Young Faculty Award of the year for 2013 and the winner of CCF-IEEE CS Young Computer Scientist Award and China's National Lofty Honor for Youth under 40 of the year for 2019.

Speakers

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