FOUNDATION
OPENHW™
PROVEN PROCESSOR IP

OpenHW Foundation RISC-V Cores:
How we accidental ended up in Space

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Agenda

- Industrial Grade, Open Source RISC-V Cores, what does it mean for Space?
- Motivations to join OpenHW and make the Hardware revolution happening
- OpenHW Cores lineup

  Cores, Compilers, Organization

Industrial Grade, Open Source RISC-V Cores, but who uses them?

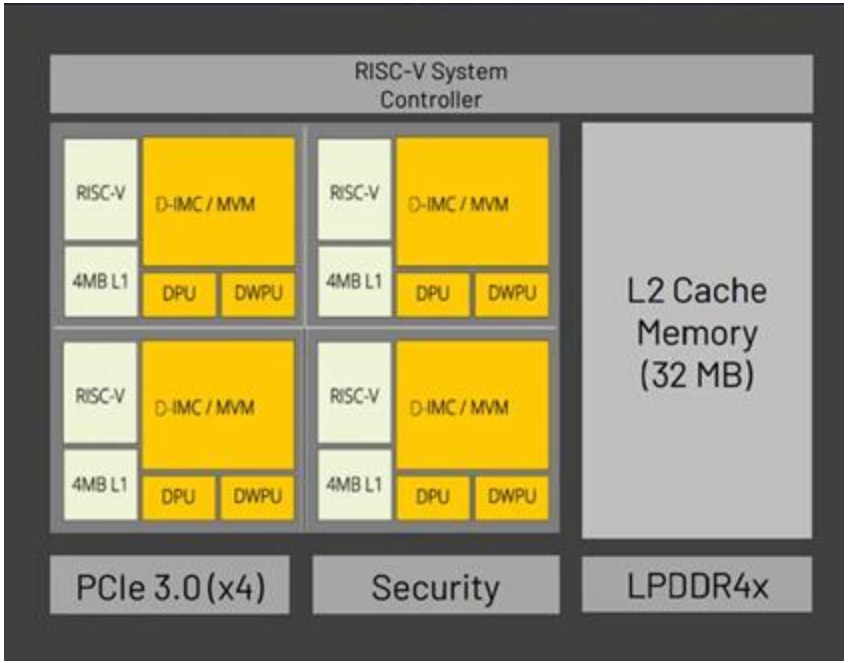
Case Studies

AI at the Edge

AXELERA ARTIFICIAL INTELLIGENCE **edge AI**

- Low-power (Could run on battery)
- Suitable for deeply embedded applications
- Available in M.2 form factor

- Again, a simple design
  - Again: Common building blocks with RISC-V Controller
  - Important: Security on-chip!

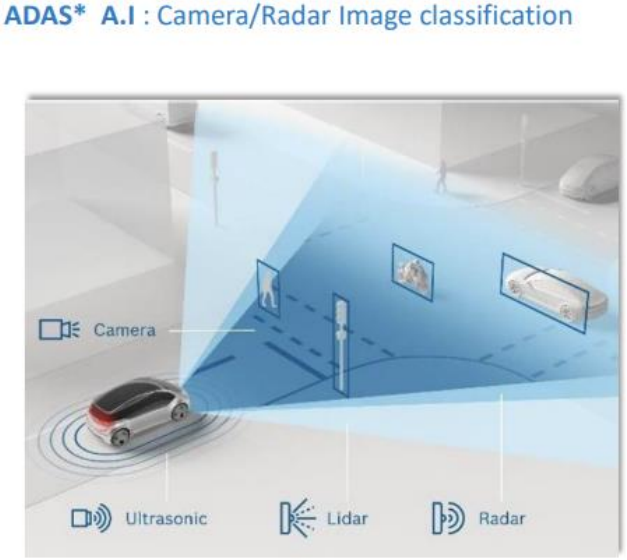


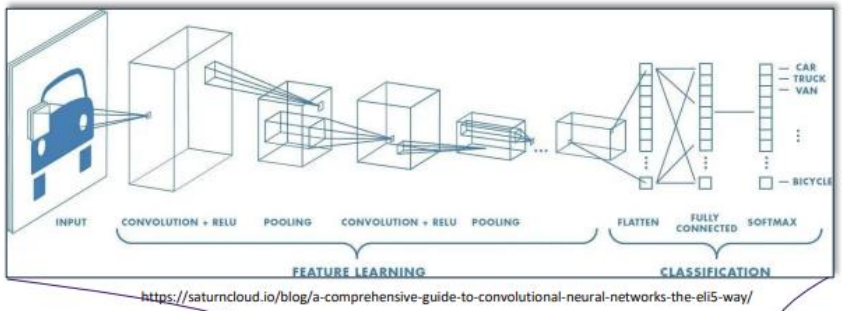
RISC-V in Automotive

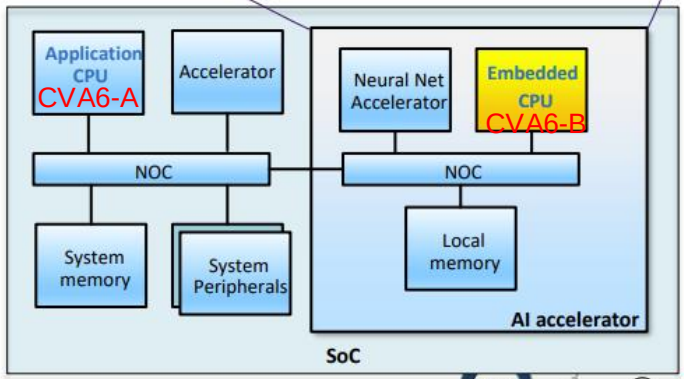
Bosch in Tristan (a Europe Chips JU consortium)

ADAS for object detection powered by OpenHW CVA6 RISC-V

2 Cores, different config.



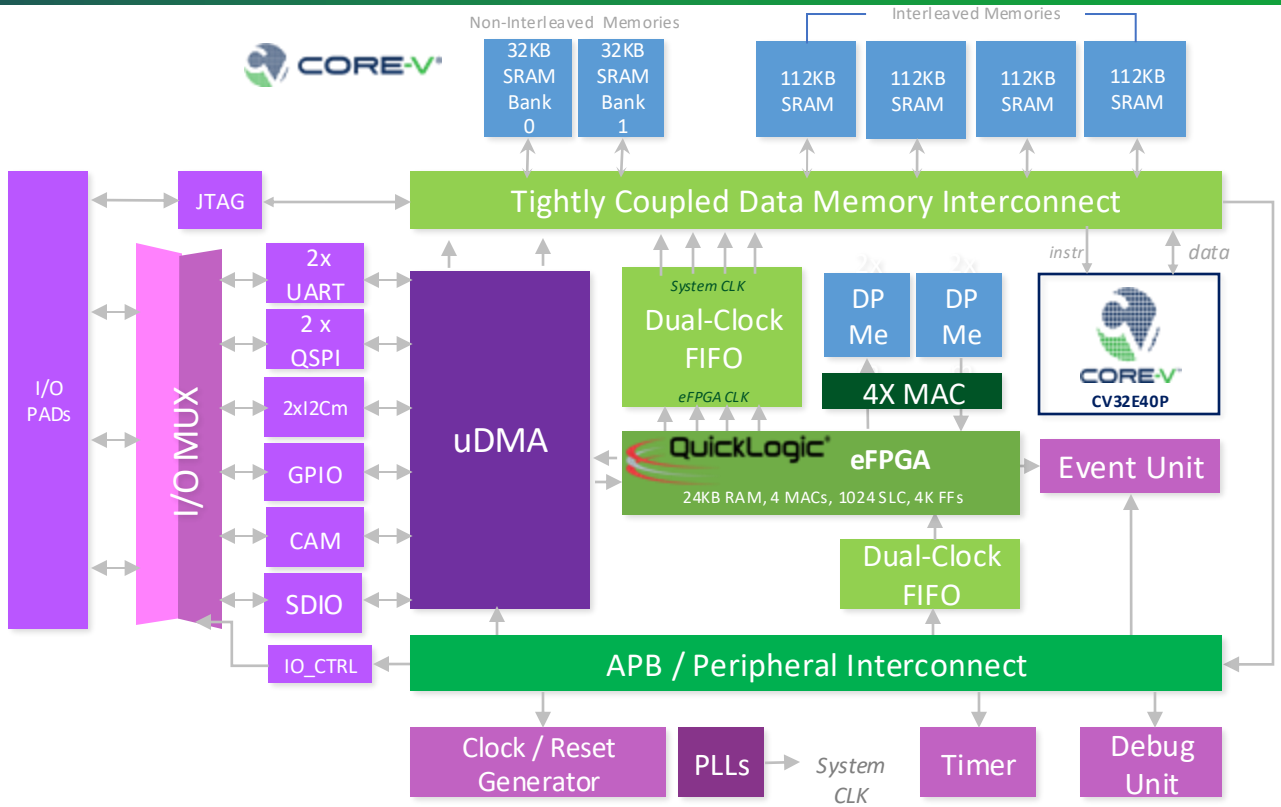




Source: https://www.youtube.com/watch?v=Hfj7wsad1tA

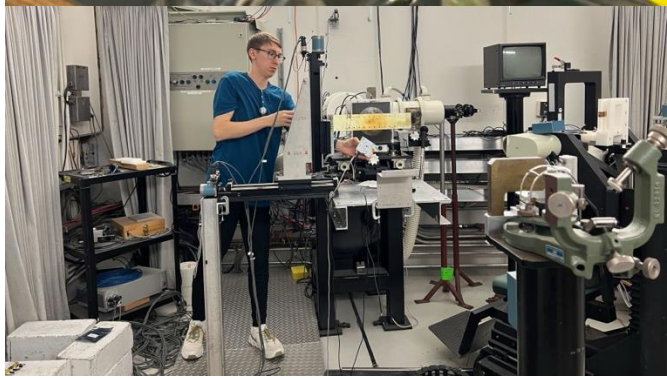
CORE-V MCU

- Real Time Operating System (e.g. FreeRTOS) capable ~400+MHz CV32E4 MCU
- Embedded FPGA fabric with hardware accelerators from QuickLogic
- Multiple low power peripheral interfaces (SPI, GPIO, I2C, HyperRAM, CAMIF, etc) for interfacing with sensors, displays, and connectivity modules
- Built in 22FDX with GlobalFoundries



Accidently going to space

- Or: How collaboration really flowers
- University of Saskatchewan developed a radiation hardened PDK for GF 22FDX
- How to test it quickly?
  CORE-V-MCU to space
- Took our CORE-V-MCU open source design, swap PDK, do some magic and hand over to GF to get StarRISC



Motivations to join OpenHW and make the Hardware revolution happening

Why commercial Company’s join?

The Value of OpenHW Membership

Engage in the development and verification of high-quality open source cores, contributing to the advancement of RISC-V architecture.

Collaborate with other industry leaders to drive shared goals and projects.

Shape the direction of key technologies and initiatives participation in projects and committees.

Access cutting-edge RISC-V hardware IP, influence industry standards, and leverage OpenHW's industrial-grade cores in your projects.

Gain visibility through association with leading open source initiatives and promotion via OpenHW's global communications channels.

Ensure the sustainability and longevity of your technological investments by engaging in strategic initiatives.

Industry Members 100+ Members & Partners

TRISTAN Overview

“Together for RISc-V Technology and ApplicatioNs”

TRISTAN is a 36 month KDT-JU (Key-Digital Technology Joint Undertaking) program under the Horizon-Europe calls via a public-private partnership focused on research and innovation to reinforce the EU’s strategic autonomy in the electronic components and systems sector

Commercial ready RISC-V Cores for SME

There are 46 participants in TRISTAN and several are part of OpenHW Group ecosystem

ETH zürich THALES cea SIEMENS

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

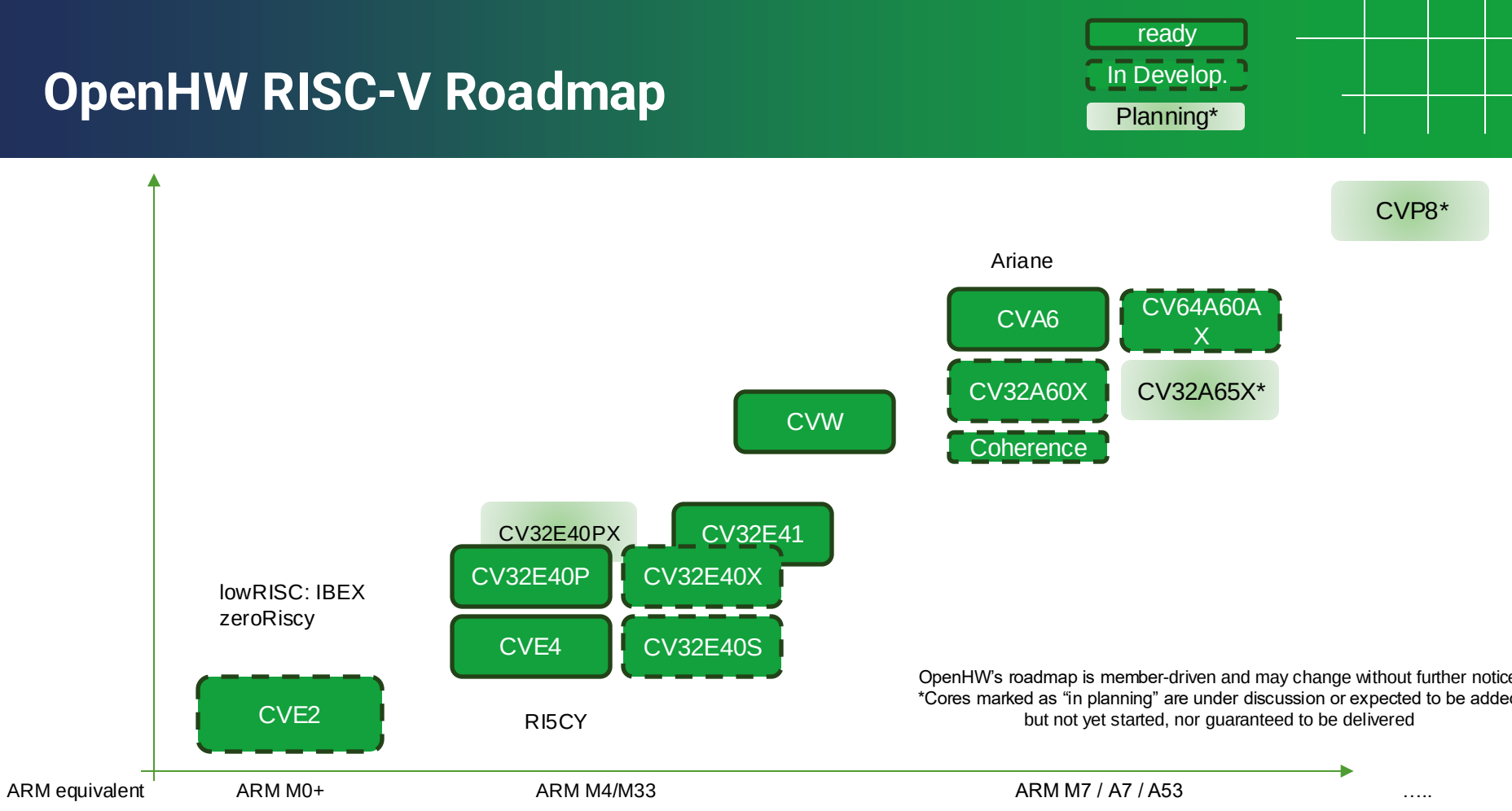
OPENHW FOUNDATION

Where do I Find Industrial-Grade Open Source RISC-V Cores?

OpenHW Foundation has them?

For Free?

OpenHW RISC-V Roadmap



OpenHW Foundation Deliverables

- **License**
  - Apache 2.0/Solderpad
- **Cores**
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  - UVM, System Verilog, a little python and tcl
- **Tools**
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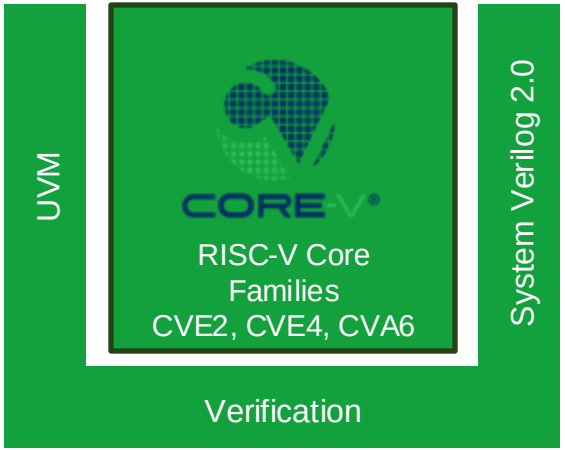

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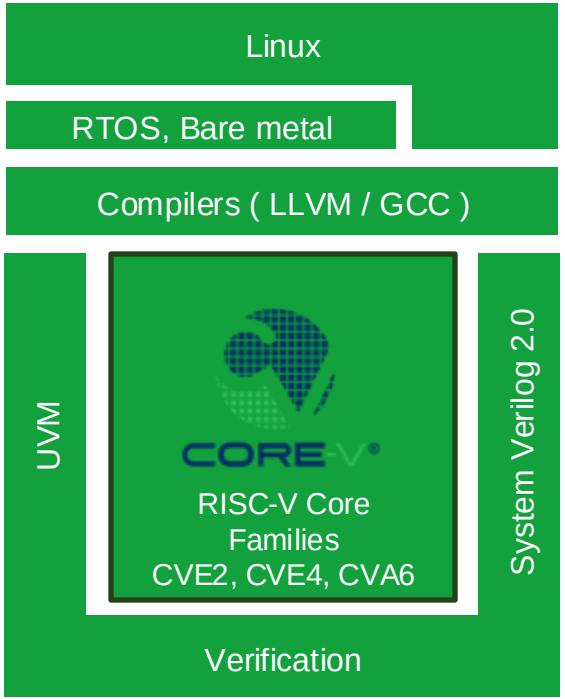

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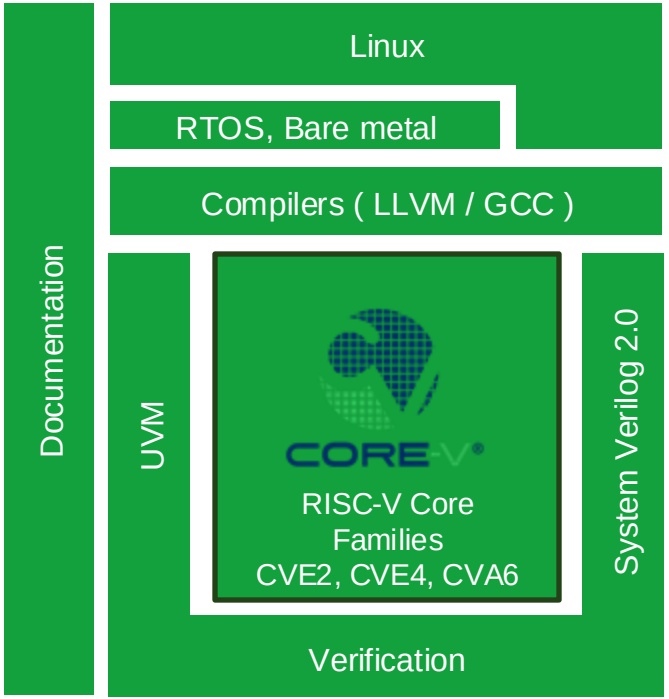

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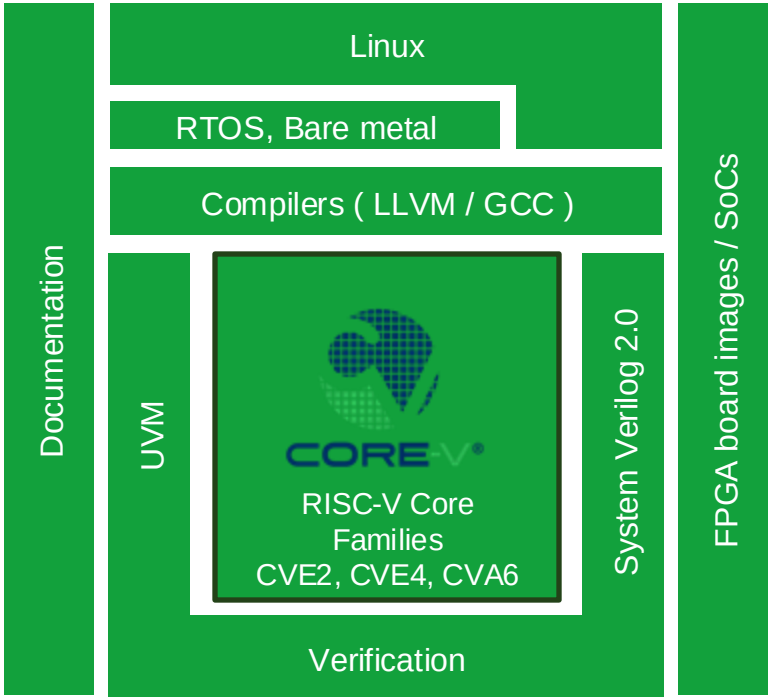
- **FPGA Board Images / SOCs**
  - Digilent Nexys A7
  - Digilent Genesys 2



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Thank you!

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