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All-in-one RISC-V AI IP

Roger Espasa, CEO

In Order Core

OOO Core

OOO Vector Unit

Tensor Unit

About Semidynamics

Semidynamics, founded in 2016, is a **100% European** supplier of RISC-V IP cores, HQ in **Barcelona**, specializing in **customization** of **high bandwidth high performance AI cores** for **tailored projects**

Experts in customizable AI IP

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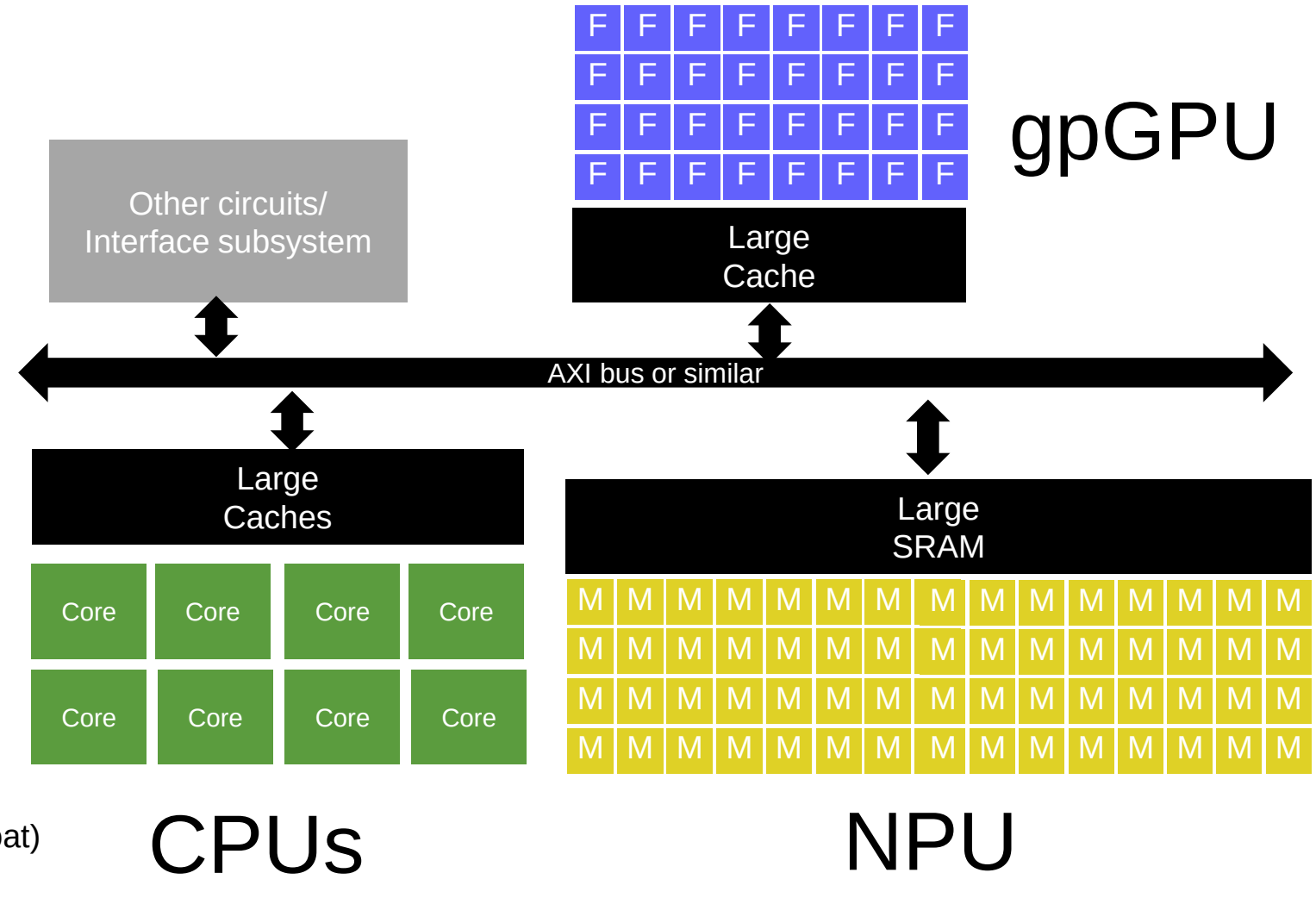
Market Trend

All new SOC designs driven by increased AI demands

Typical AI-focused SOC today…



- **Hard** to program
- **High** Latency
- **Non-optimal** PPA
- **Three** Software Stacks
- **Obsolesence** by new AI algorithms

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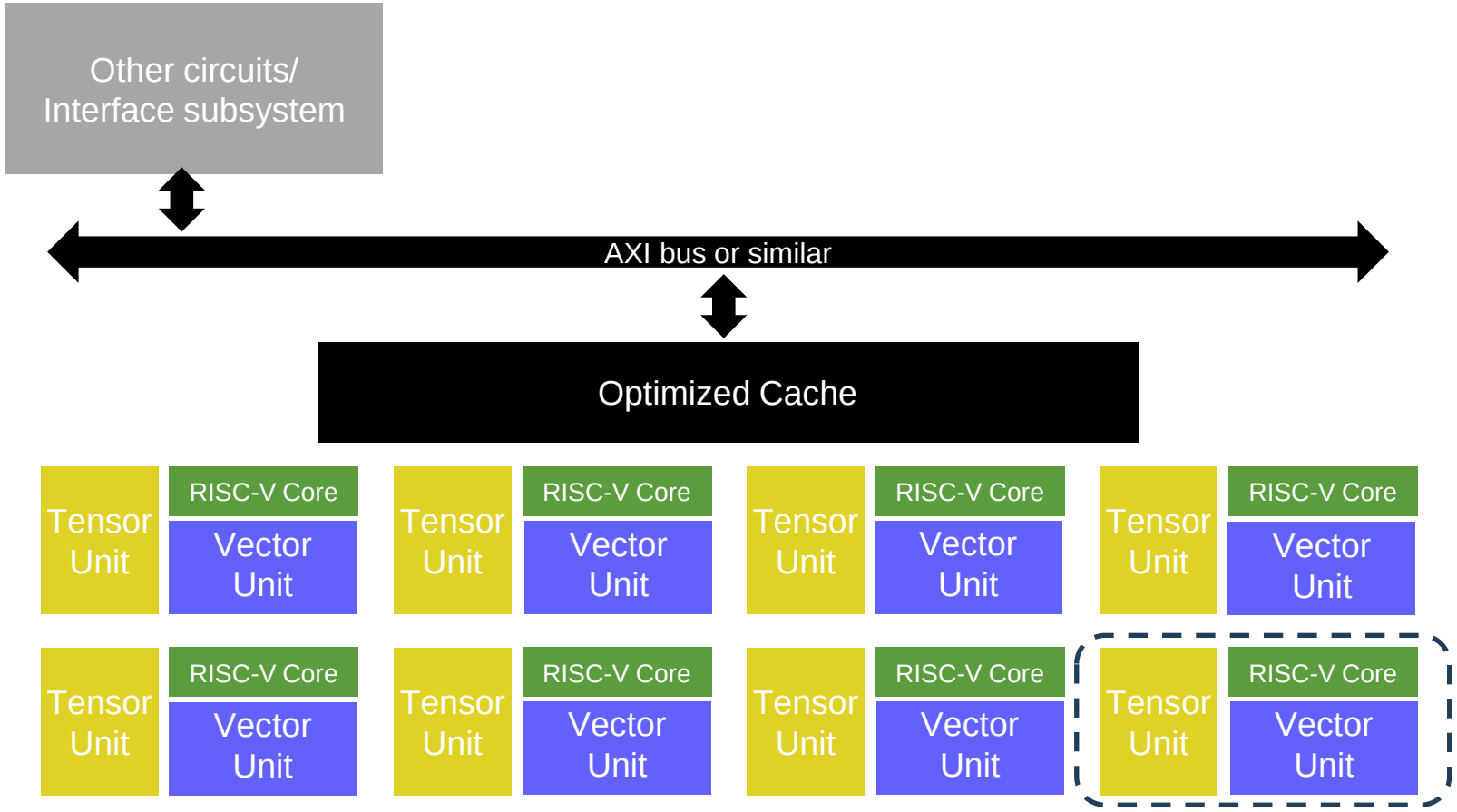
Our vision: Fusing CPU, gpGPU, and NPU



- **Easy** to program
- **High Performance**
- **Zero** Latency
- Better **PPA**
- **Resilient** to new AI
- **Unified** programming
- **One** software stack only

All-in-One
AI IP Element

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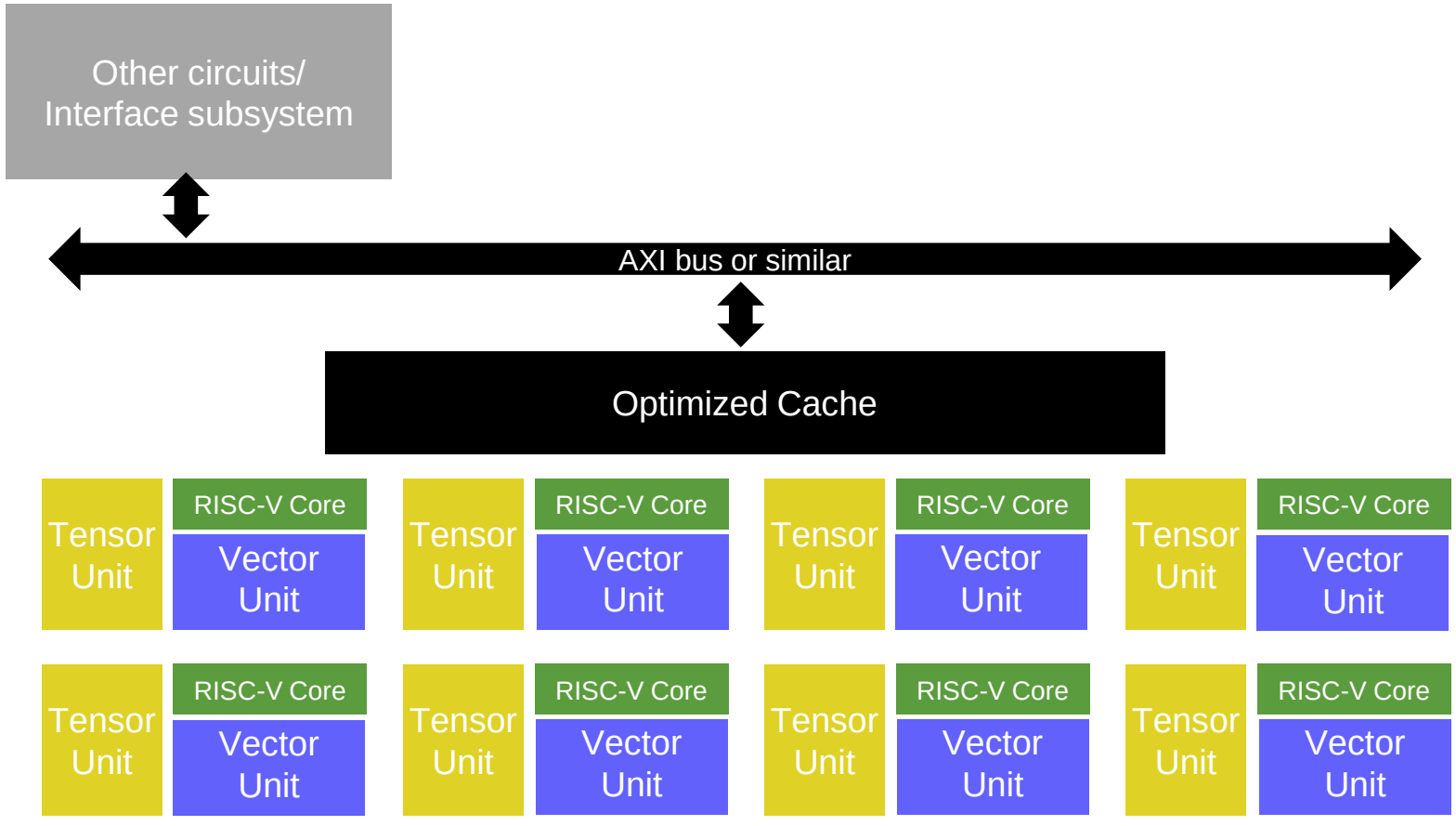
You can run Linux on our RISC-V Cores…



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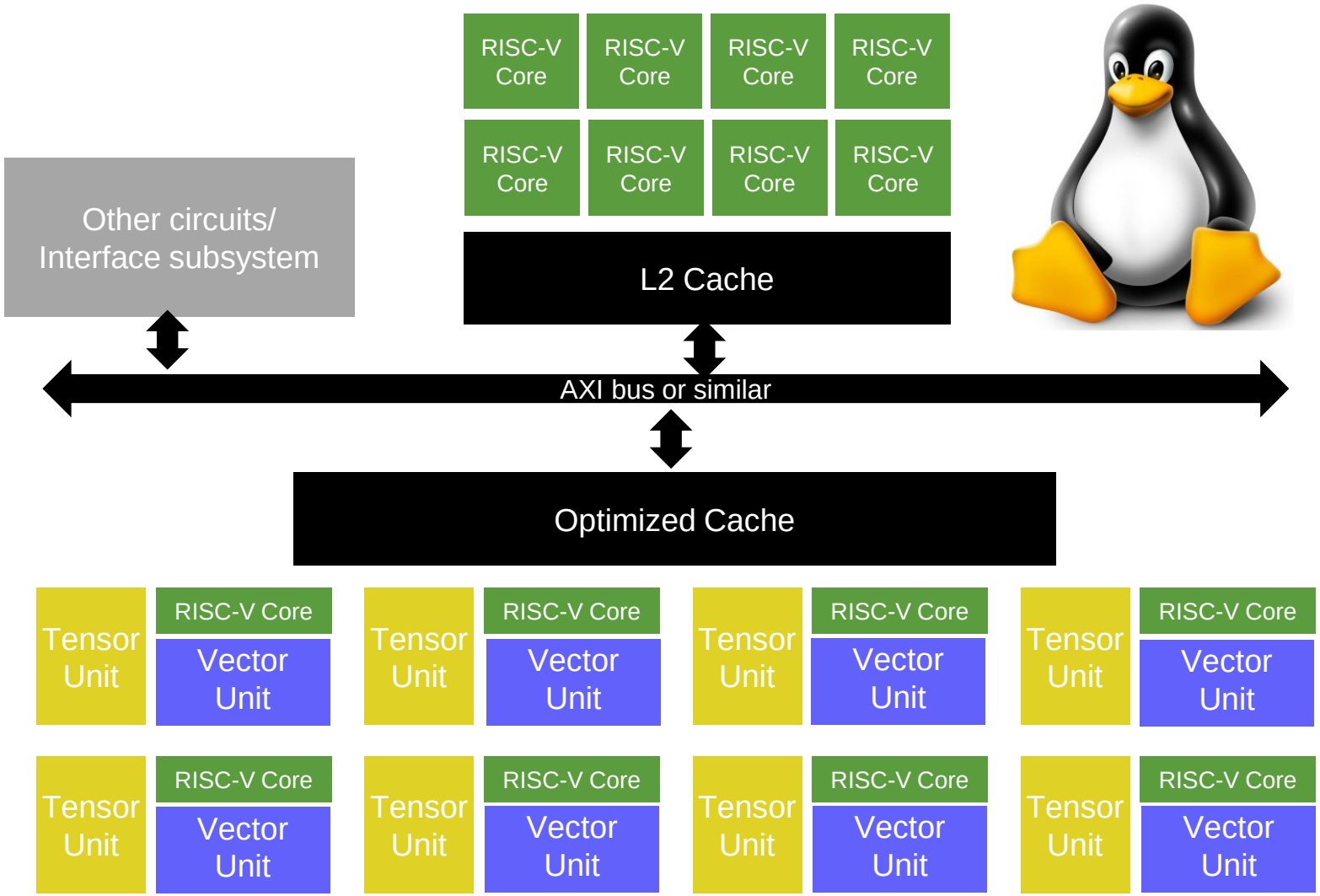
Or you can add a separate Semidynamics RISC-V Core Cluster to run Linux



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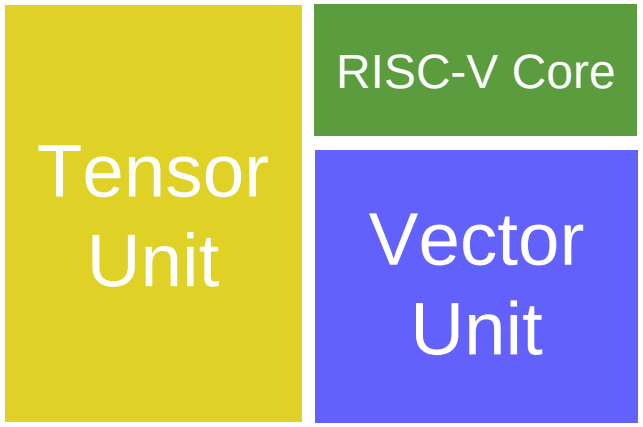
Vision Delivered: All-in-one AI IP



Atrevido (勇敢な 无所畏惧 Fearless 용감한)

64b out-of-order RISC-V CPU, AXI and CHI

Vector Unit: RVV1.0, 128b to 2048b

Tensor Unit: 0.25 to 8 $TOPS_8$

INT8, FP16, BF16

Each Vector Unit : from 4 to 32 FMAC units
Each Tensor Unit : from ¼ $TOPS_8$ to 8 $TOPS_8$

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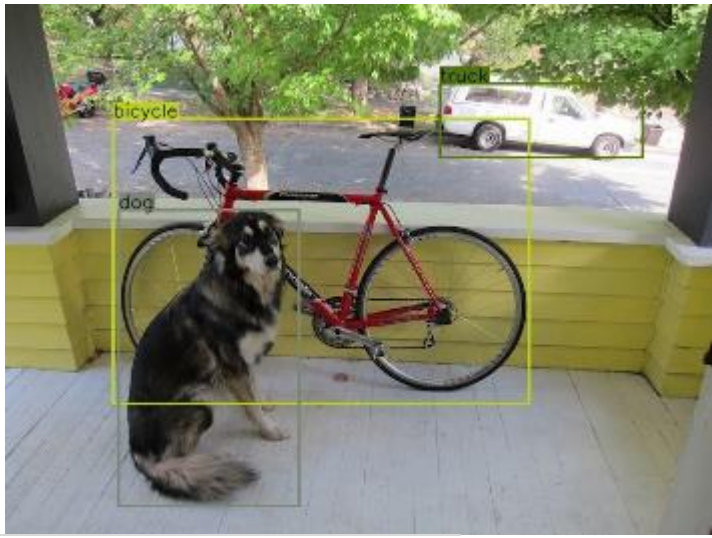
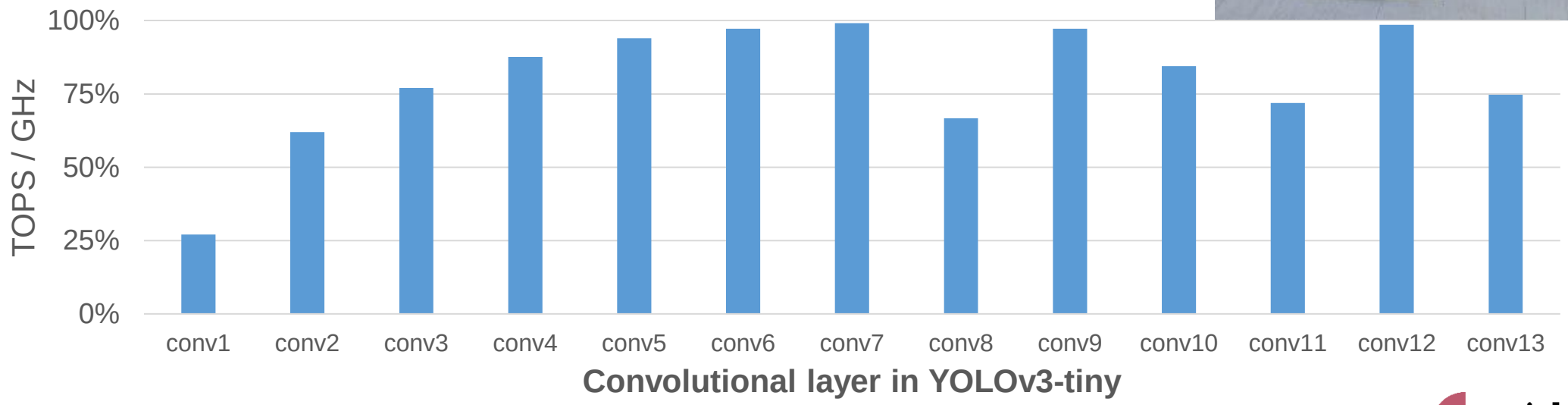
YOLO on single All-in-One IP: 33 FPS

- Performance at 1GHz
  - All-in-One IP (single instance): 33.03 FPS
  - Real-time performance with one Tensor Unit





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Flexible and customizable Business Model

Customize IP

- AXI, CHI
- Cache Sizes
- Branch predictor
- Custom instructions
- RV32
- Small Core…

Evaluate

- Single Core
- Multi Core
- Vector Unit

License

- License Fee
- Royalties

Maintenance

- Bug Fixes
- Timing fixes
- Area Fixes

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Summary

- Market trend: all new SOCs need AI
- AI workloads continuously change and require more performance
- Current designs are sub-optimal and non-resilient to AI changes
- Current designes require three hard-to-program SW stacks
- **Our solution: All-in-one RISC-V AI IP**
- Available NOW

Let’s build the AI future together

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Thank you

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