OPENSOURCE F INTHEDESIGN OF SYSTEMS

Industries are driving data analytics use cases



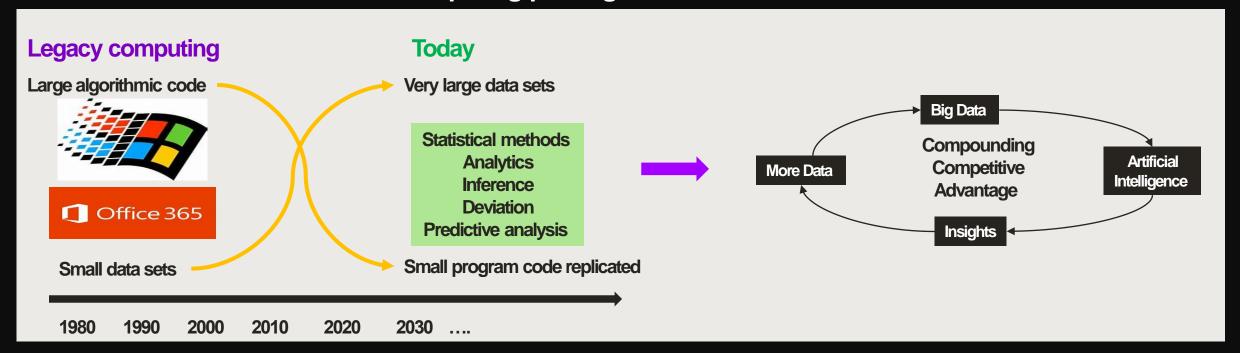
- Finance
- Banking
- Healthcare
- Fraud detection
- Science
- Manufacturing

- Retail
- Advertising
- E-commerce
- Education
- Automotive

- Image & video processing
- Natural language
- Fraud detection
- Patient diagnosis
- Anomaly detection

- **Inventory optimization**
- **Demand forecasting**
- Recommendation system
- Intrusion detection

Computing paradigm shifts



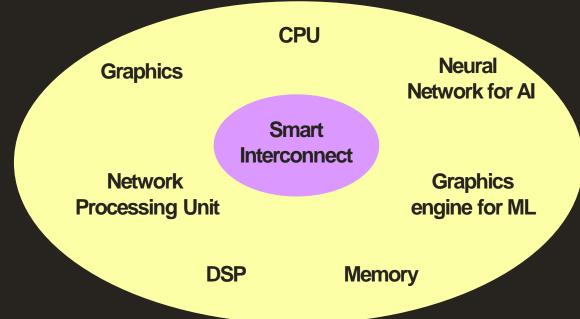
Where is the industry going?



Scalable System Design integrating various processors – targeting specific use cases

Around Smart Interconnect, SoC architecture integrates:

- CPU
- Graphics
- Graphics engines for ML
- Neural Network for Al
- Network Processing Unit
- DSP
- Memory



The CPU will always play a critical role in the system architecture

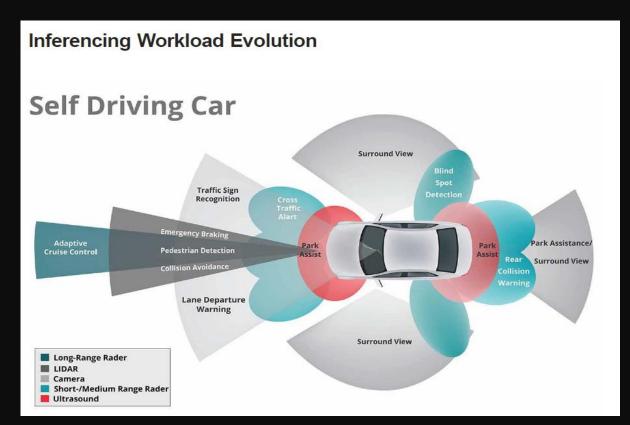


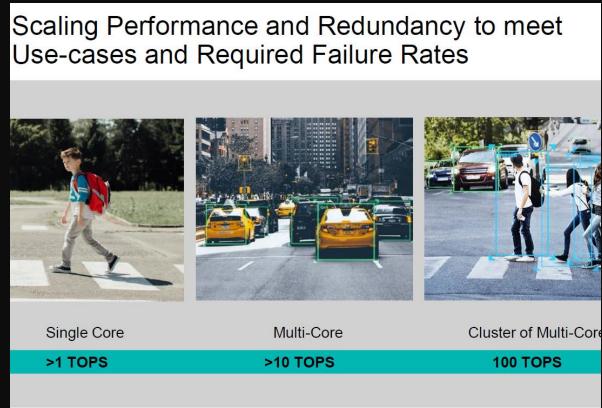
Flexibility, transparency in the CPU ISA are fundamental requirements

- Flexible and Open architecture (custom instructions, data paths, accelerators)
- Custom extensions
- Transparent security model

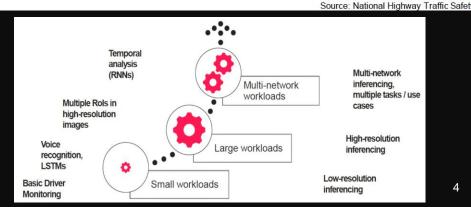
Automotive is a very good example of this new trend





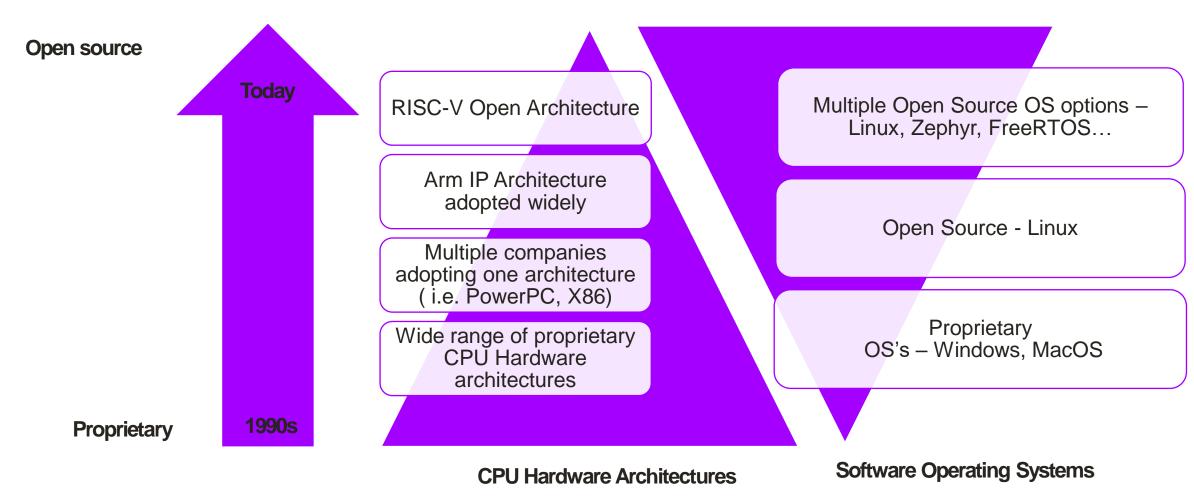


Additional functions drive greater workloads and unique requirements on the architecture of the system





MOVING FROM PROPRIETARY TO OPEN ISA ARCHITECTURES



May 23

OPEN-SOURCE ARCHITECTURE - RISC-V ISA



- RISC-V foundation based in Switzerland non-profit neutral vs geopolitical challenges
- Driven by contributions of members no control by one entity enables independence
- Growing ecosystem
- Open ISA
- Scalable architecture
- Custom extensions for unique use cases and operations
- Transparent security model
- Traction with academic world
- Traction across markets
- Emerging traction in high end market, including Automotive
- Technology of choice for secure enclaves
- Linux software ecosystem
- Tools chain (GCC, LLVM)





Embedded Intelligence with Open-Source ISA

IoT

Retail PoS automation Smart Cities

Asset Tracking

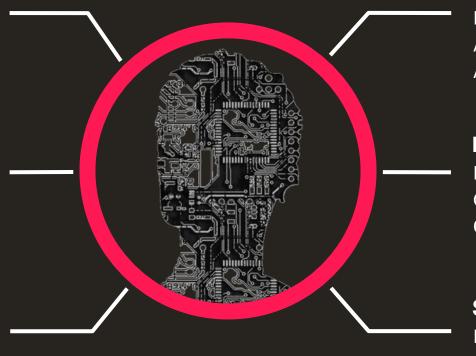
Security
Smart Buildings
Foot-fall analytics

Consumer/Media/AR/VR

Image enhancement Gesture Control
Viewer analytics Voice UI
Environment awareness User interaction

Automotive

Emergency braking Driver monitoring
Lane departure warning Navigation& safety
Collision warning Traffic sign recognition



Mobile

Facial identification Picture annotations
Application monitoring Speech recognition
Advanced camera filters Smart Assistance

Industrial

Defect detection
Object detection
Context awareness

Smart Surveillance

People tracking Abnormal behaviour alerts

Queue Monitoring Event detection

Engagement recognition Vehicle detection

May 23 7

Why an open-source ISA for Imagination?

An open standard that reduces reliance on one supplier

Driven by a wide range of contributors from many different disciplines

Already widely adopted, and gathering pace

RISC-VISA

Range of performance points from one architecture, from sensors to high end servers

Modular and extendable to match end use case requirements

Flexible

Open International Board

Leadership roles in
Technical and
Marketing aspects to
drive forward the
community

Leadership

Enabling ecosystems across a wide range of segments

Working together brings innovation to market quicker

Android support for RISC-V committed by Google

Ecosystem

Flexibility for the customers of Imagination

Mid tier to high end solutions

Markets = Modems, Automotive, Heterogeneous computing

5G Modem Controller
Real time
Deterministic
MPU
32-bit

Safety Island
ASIL-D
High End Real time
MPU
Deterministic
32-bit

Automotive Gateway
ASIL-B
High end 64 bits
Multi core
MMU + 64b
Integration with EPP

<u>Software ecosystem</u>: Toolchain (GCC, LLVM, Debug), FreeRTOS, full Linux with bootloader + kernel + file system

Automotive certification ISO 26262



What does and open-source ISA deliver to developers and their customers?

- Customization for the use cases of our customers
- Optimization for specific performances
- Flexibility of the architecture
- Ability to certify products all the way to the IP
- Breadth of possible solutions
- Multiple performance points
- Optimized for use cases
- Clear and open governance
- Neutrality

Build uniquely differentiated solutions with an open-source ISA



THANK YOU