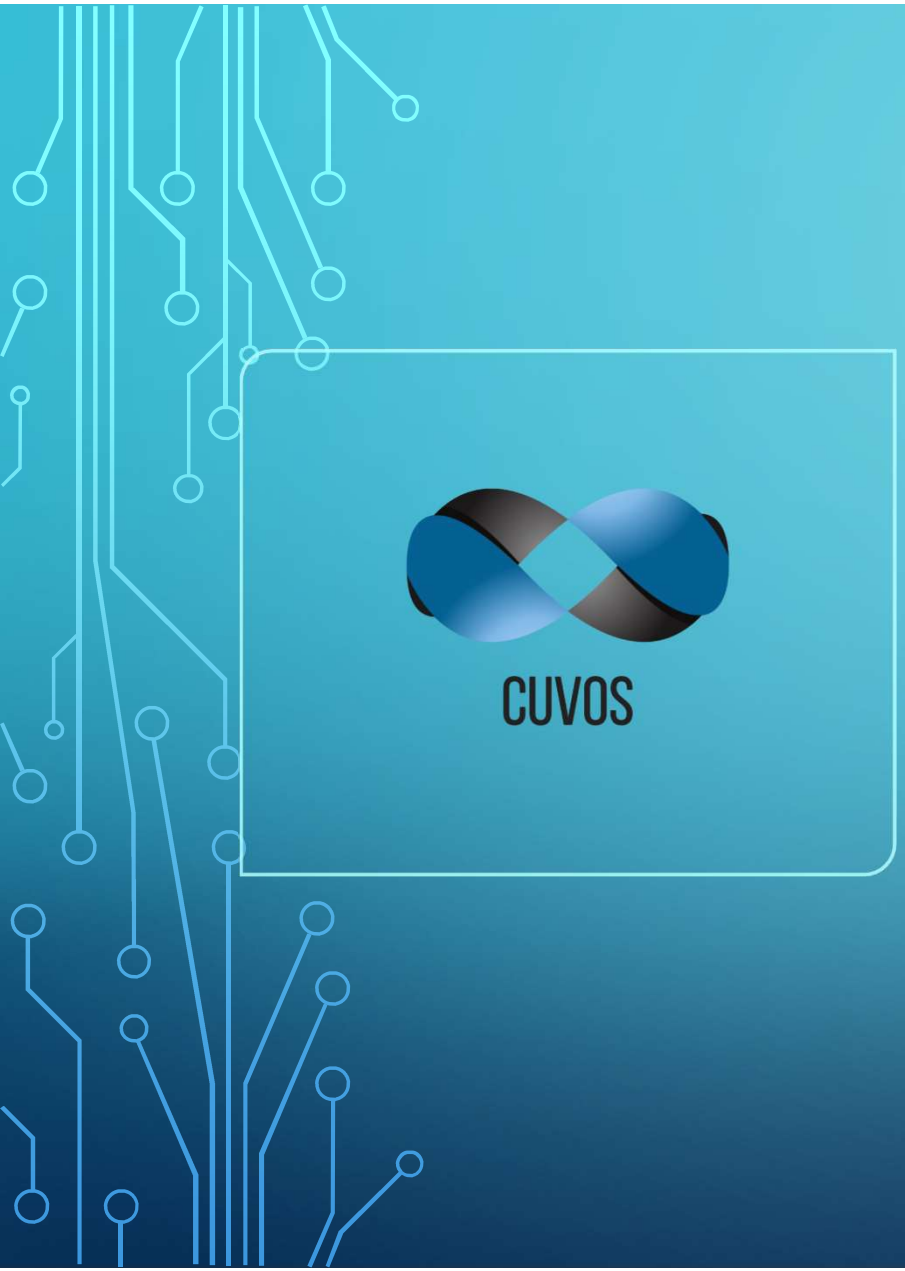


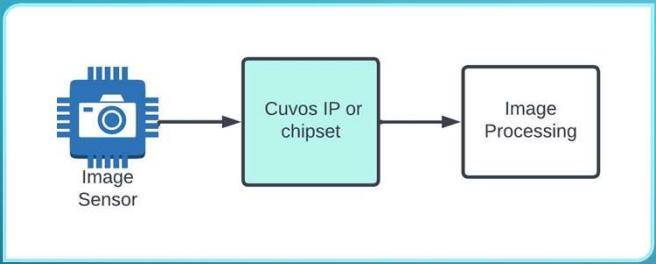
ADVENTURES WITH FPGAS IN THE WILD

TARA JULIA HAMILTON, PH.D.

CHIEF SCIENTIST

CUVOS PTY. LTD.

ABOUT CUVOS



- Australian Owned and Operated
- Specializes in bio-inspired and neuromorphic sensor development
- Current products:
  - Eagle Eye: low- and bright-light enhancement – see in the dark, see into the sun!
  - Hawkeye: an event-based camera modelled after the blow-fly eye

EAGLE EYE

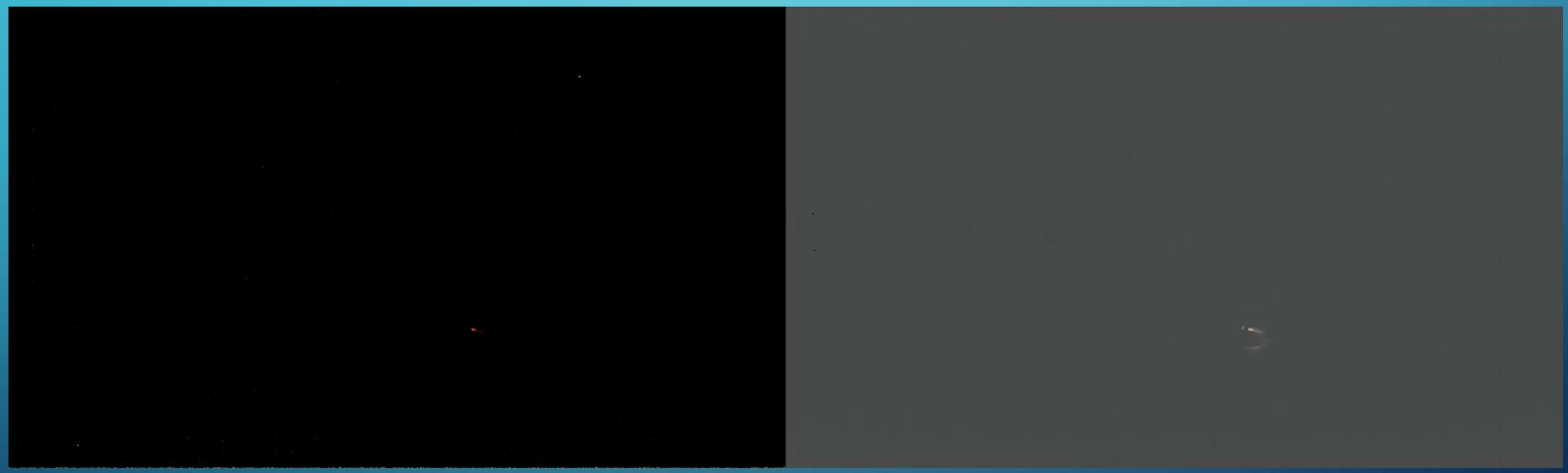
CUVOS

EAGLE EYE

CUVOS

EAGLE EYE

CUVOS

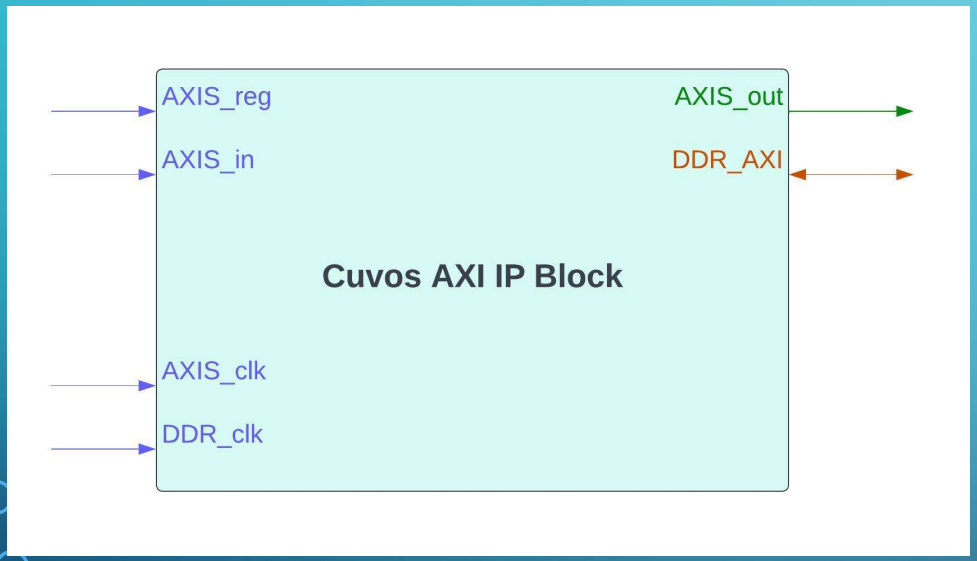


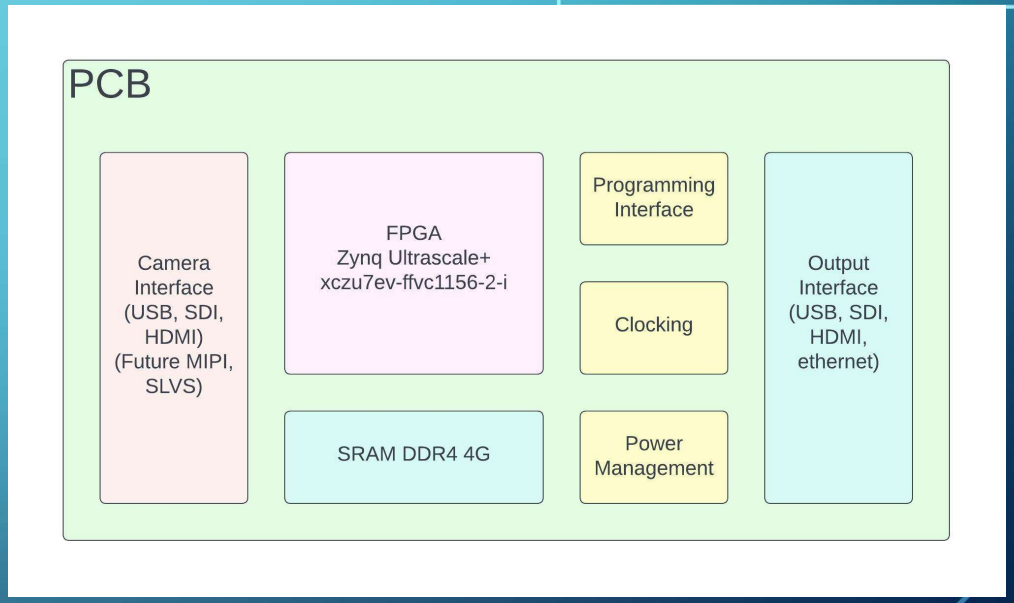
HAWKEYE

CUVOS

IP BLOCK AND CHIPSET

CUVOS



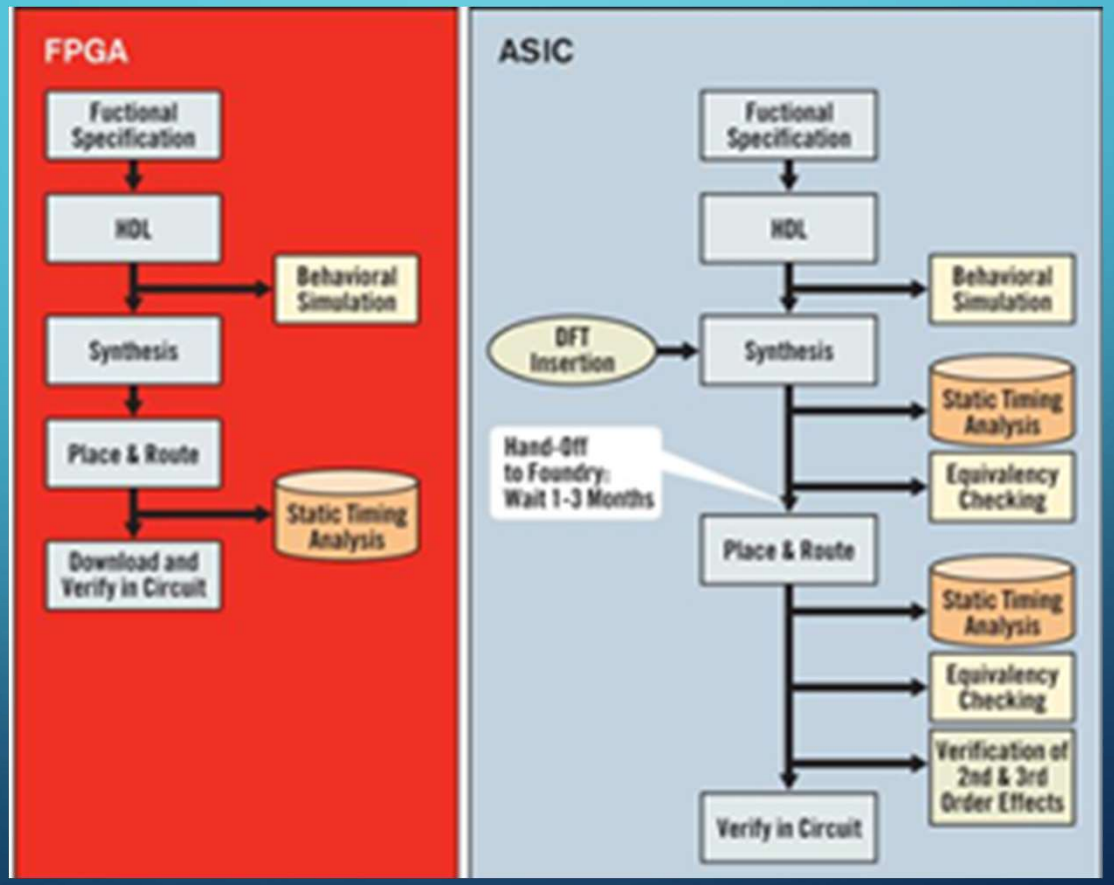


WHY FPGAS?

- Cheaper to develop
  - Chip design is expensive – design, fabrication, packaging, testing, production-cycle

FPGA VS. ASIC

CUVOS



WHY FPGAS?

- Cheaper to develop
  - Chip design is expensive – design, fabrication, packaging, testing, production-cycle
- High-speed
- IP
  - Available with FPGA vendor
  - Can sell IP as a product
- Faster route to production

WHY **NOT** FPGAS?

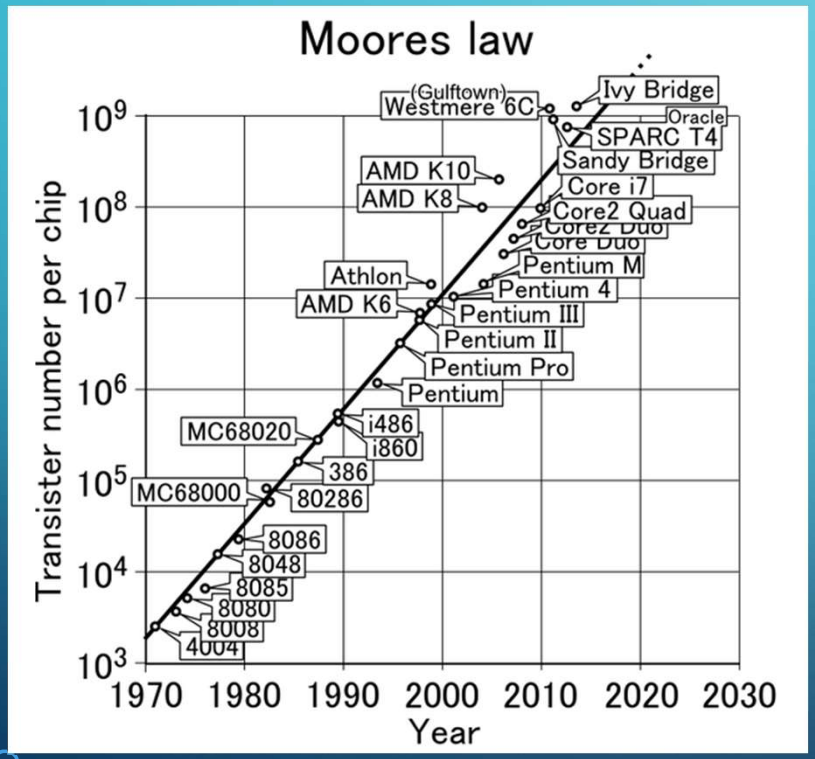
- Power consumption
  - General functionality means that power is lost
- IP
  - General purpose IP is not optimized
  - Using external IP can compromise ability to patent and protecting internal IP
  - IP updates and changes externally, requires constant updating of product

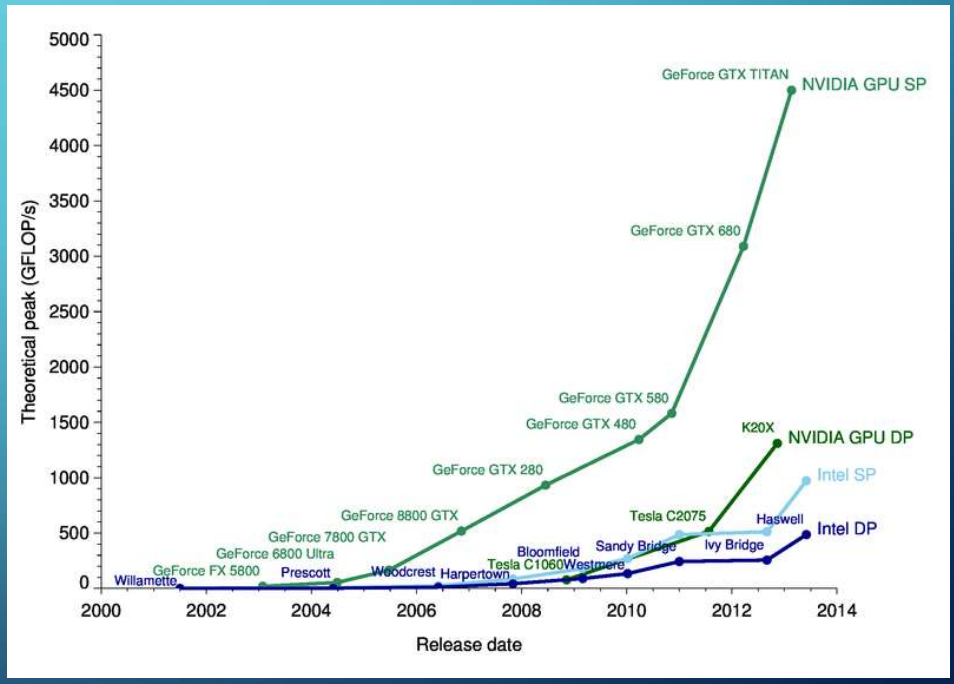
WHY **NOT** FPGAS?

- Volume
  - It becomes cheaper to develop ASICs when you have large volume
- Dependence on external inventory and technology decisions
  - E.g. Xilinx sells a lot of devices to high-speed trading and can result in shortages to other industries

THE FUTURE OF FPGAS AND CHIP DESIGN

CUVOS





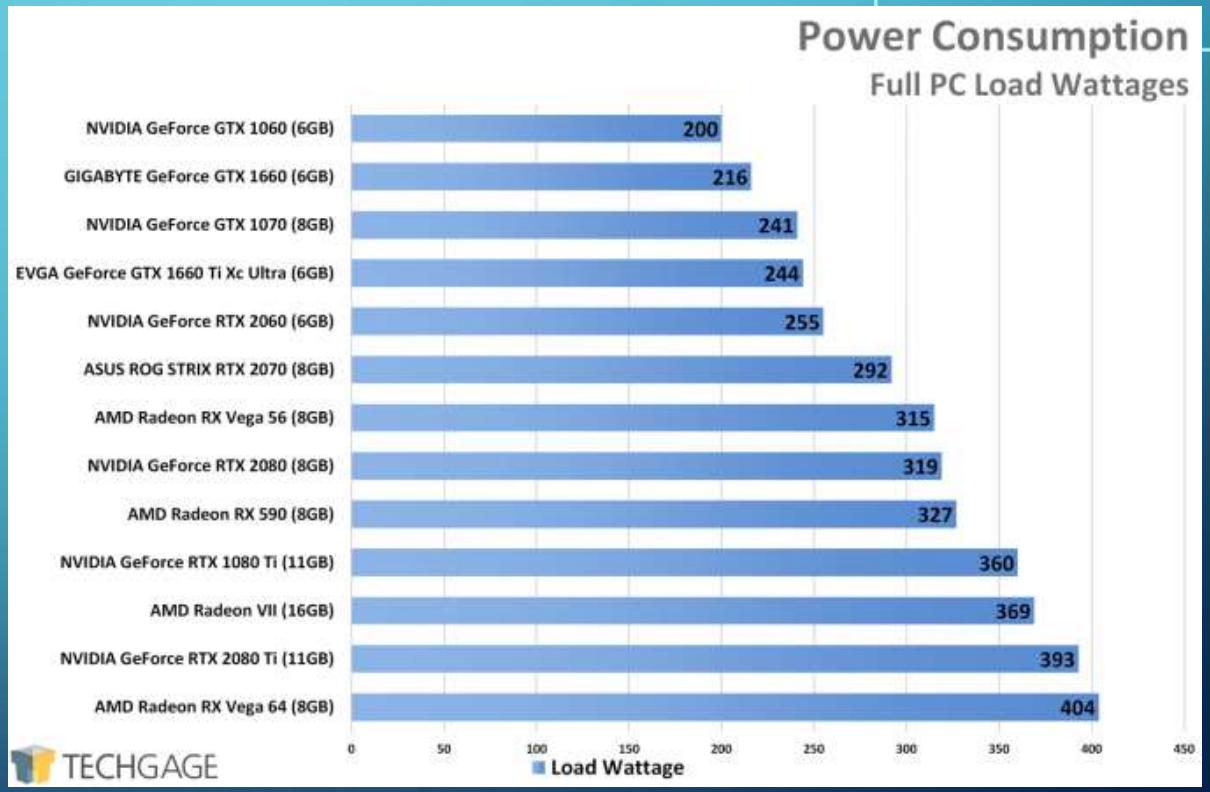
THE FUTURE OF FPGA AND CHIP DESIGN

- FPGAs
  - Lower power
  - Edge AI functionality
  - Multipurpose data processing
- CPUs
  - Parallel
  - Low-power
  - RISC-V

THE FUTURE OF FPGA AND CHIP DESIGN

CUVOS

- GPUs
  - Higher throughput
  - High-power
  - Greater performance



WHAT'S NEXT?

- Edge computing
- Machine learning and AI co-processors
- Bio-inspired and neuromorphic architectures
- General computing
  - Power
  - Speed
  - Performance
  - Open source e.g. RISC-V

THANK YOU!

Questions?