Mehmet Belviranli
Assistant Professor

YOU can do the research to solve ***tomorrow's*** problems ***today*** with:

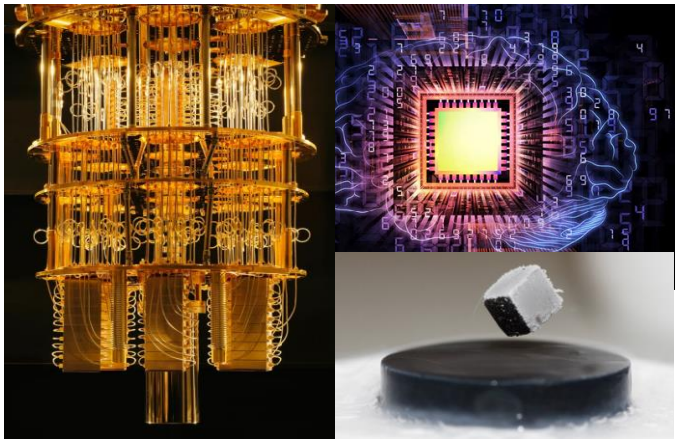
High Performance Computing for Autonomous Systems

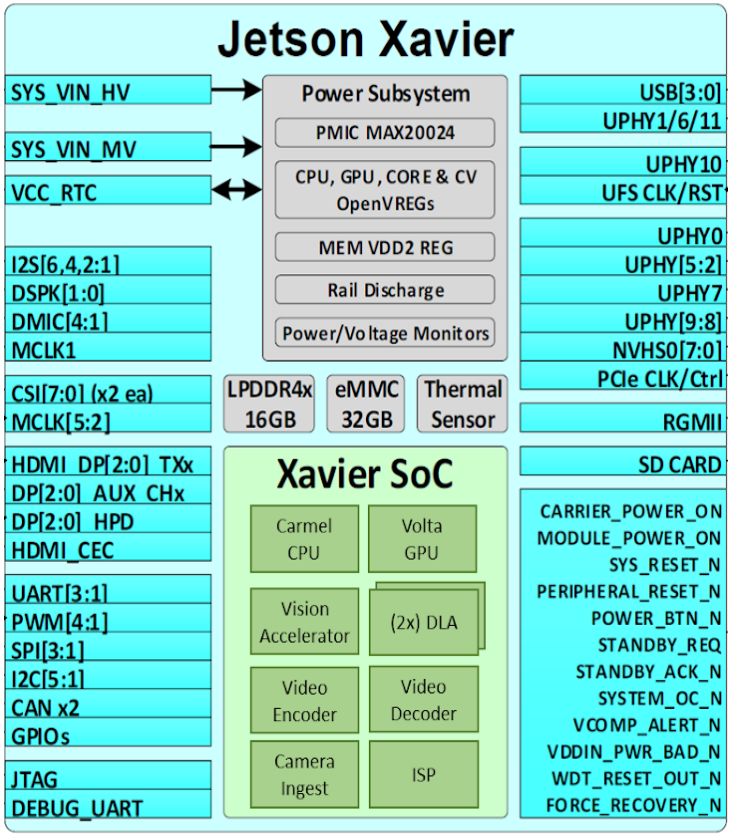
Computational Heterogeneity

- High-performance computing
- Cloud computing & Data Centers
- Rapid prototyping
- Autonomous systems

More diversity:

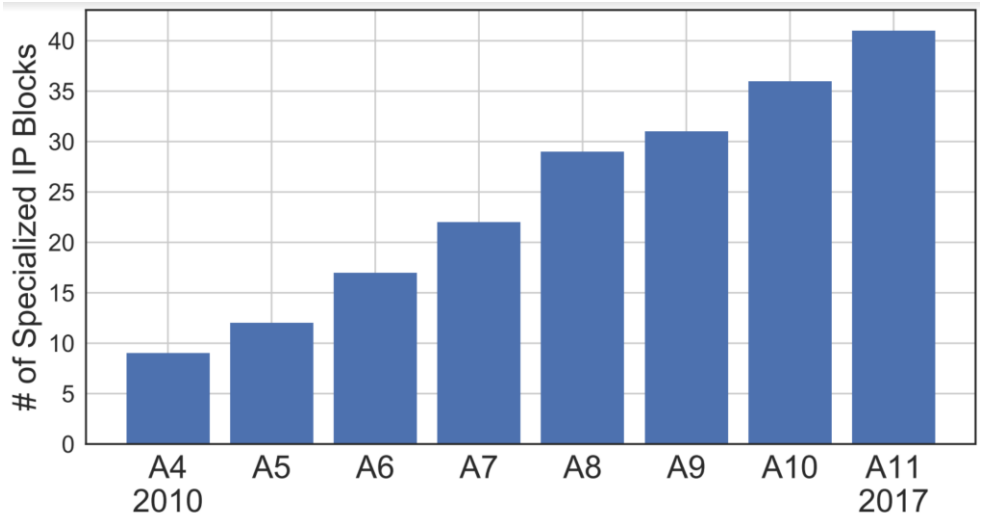
- Quantum accelerators
- Neuromorphic chips
- Cryogenic devices

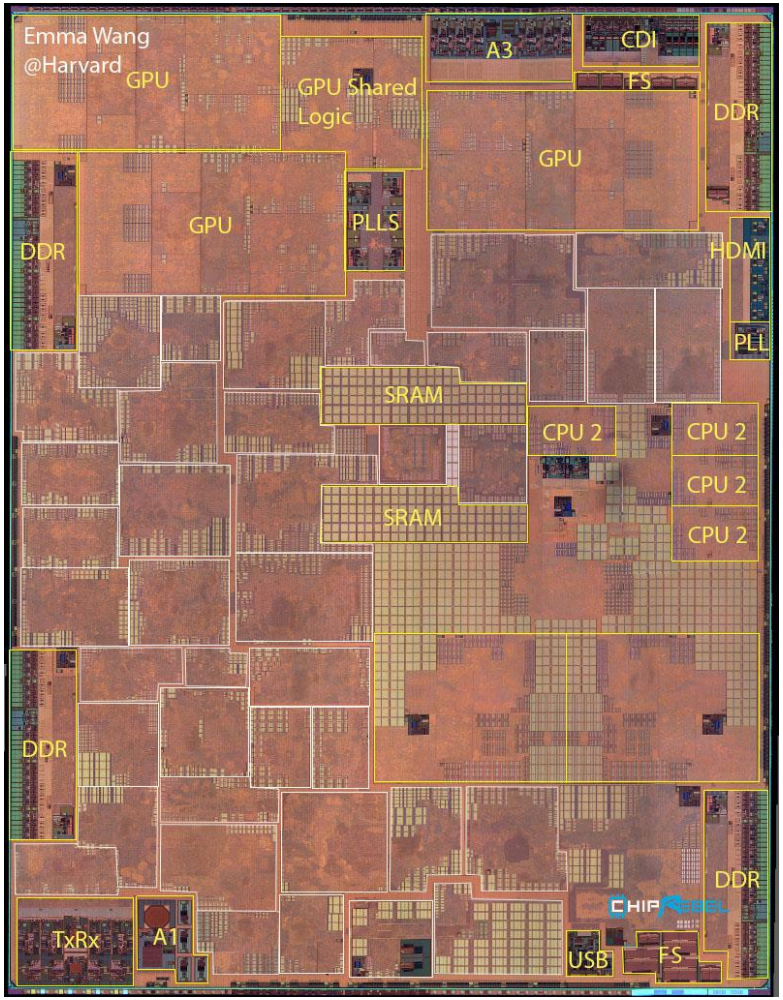




Diversely Heterogeneous Architectures

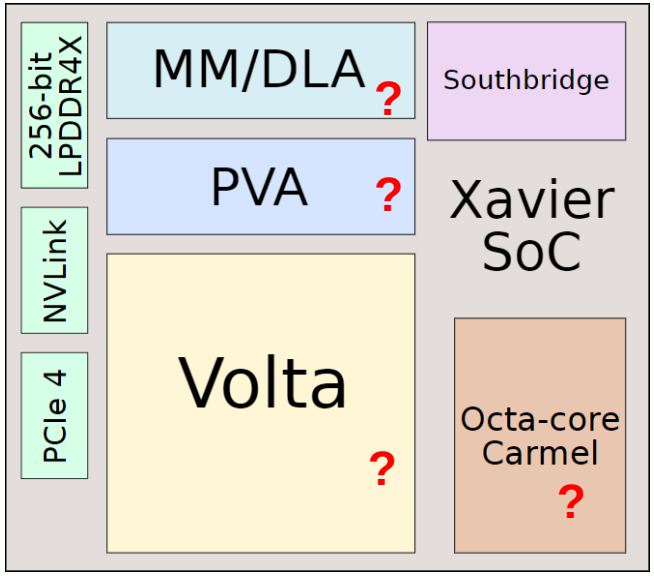
- Apple A11 Chip:
  - >40 Specialized IP Blocks



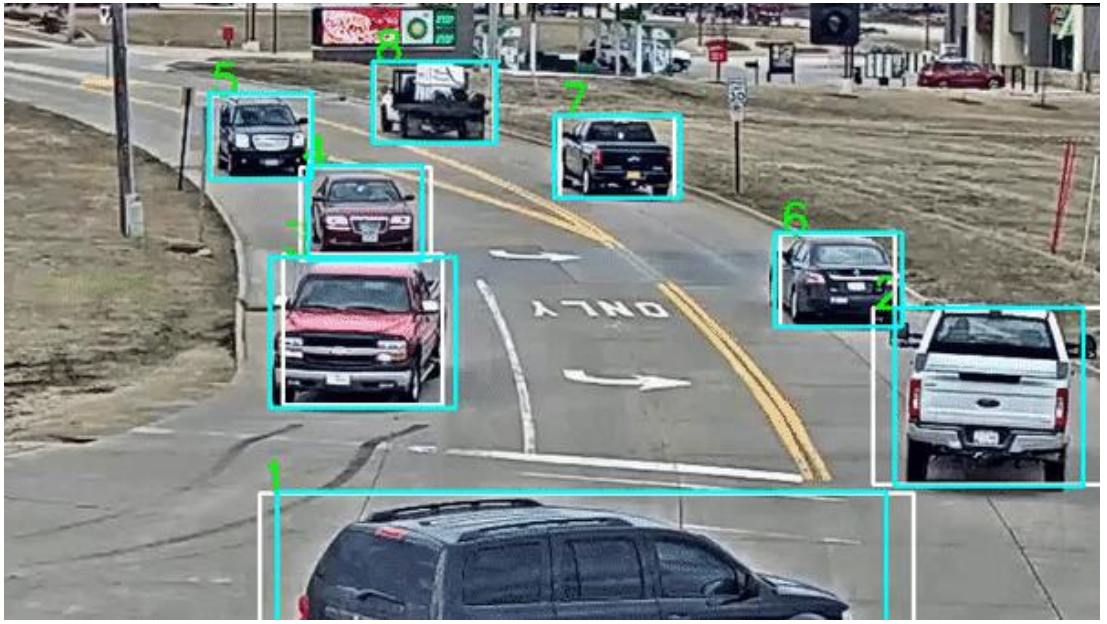


Source: http://vlsiarch.eecs.harvard.edu/accelerators/die-photo-analysis

Autonomous Computing in Heterogeneous Systems



Object Tracking



Processor	ISA / API
Carmel CPU Cores	ARMv8.2 / ARMPL
Volta GPU	CUDA / cuFFT
PVA (Programmable Vision Accelerator)	OpenCV
DLA (Deep Learning Accelerator)	TensorRT

- How to program?
- How to quantify performance?
- How to schedule?

Mehmet Belviranli
Assistant Professor

Research Interests:

- ❑ Heterogeneous architectures
- ❑ Runtime systems
- ❑ Performance modelling
- ❑ Autonomous computing
- ❑ Machine Learning Acceleration

Recent Papers:

- ❑ Int. Conf. on Parallel Architectures and Compilation Techniques (PACT'20)
- ❑ Design, Automation & Test in Europe Conference & Exhibition (DATE'19)
- ❑ Int. Conf. for High Perf. Computing, Networking, and Analysis (SC'18)
- ❑ IEEE High Performance Extreme Computing Conference (HPEC'18)
- ❑ ACM Symposium on Principles and Practice of Parallel Prog. (PPoPP'18)
- ❑ IEEE/ACM International Symposium on Microarchitecture (MICRO'17)

More Info: belviranli@mines.edu https://mehmet.belviranli.com

Ph.D. & M.S. & U.G. Research Opportunity: High Performance Computing for Autonomous Systems

Research Interests:

- ❑ Heterogeneous architectures
- ❑ Runtime systems
- ❑ Performance modeling
- ❑ Autonomous computing
- ❑ Machine Learning Acceleration

belviranli@mines.edu https://mehmet.belviranli.com