



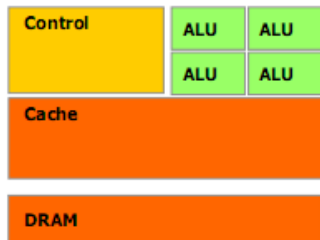
# F# OpenCL C Type Provider

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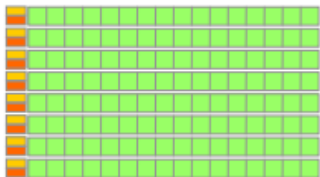
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# GPGPU



**CPU**



**GPU**

(Almost) SIMD architecture for general purpose computations on graphical processor units

- Huge amount of “simple” ALUs on single chip
- Massively parallel ....
- May be a good choice for huge data processing

# Applications of GPGPU

- Initially is scientific computations
  - ▶ Phis
  - ▶ Math
  - ▶ Chem
- But more and more general application
  - ▶ Finance/Banking
  - ▶ bio
  - ▶ Data Analytics and Data Science (Hadoop, Spark ...)
  - ▶ Security analytics (log processing)

# Problem: GPGPU <-> High level programming

- .NET, JVM, etc
- Interaction is a problem!

# Existing solutions and problems





# Type providers

# OpenCL C type provider





# Limitations

- !!!
- !!!
- !!!
- !!!

# Examples

# future work

- !!!
- !!!
- !!!
- !!!

# Summary

- Algorithm for context-free path querying
- Works on any input graph
- Supports any context-free constraints
- Is independent of matrix representation
- Can utilize GPGPU easily and efficiently

# Contact Information

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Thakns!