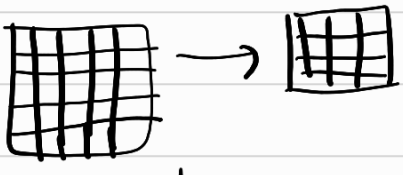
> Single Instruction, Multiple Data
- Simple programming
- Scalability
- Regularity of structure
- Wide applicability

> Granularity of SIMD

Complete fine grain

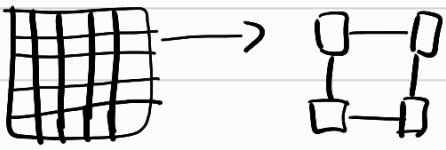
one data to each process element

Partial fine-grain



few data maps to each PE

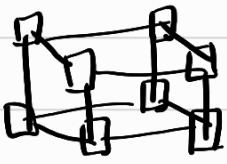
Coarse-grain



Many data map to each PE

> Connectivity of SIMD

Hypercube

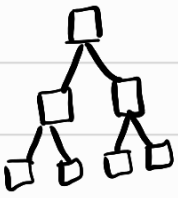


Low diameter
High bandwith
↓
each cube position
differs by 1 bit
↓
less complicated
than binary tree

Pyramid

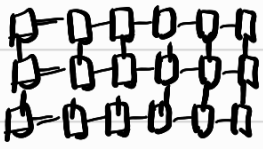
Low diameter
Complex code

Tree



Low diameter
Low bandwidth
↓
ordered, balanced
binary tree

Near-neighbour



High diameter
High bandwith

> Array addition on SIMD
  ↳ Speed up is potentially N times, $N \times PEs$
  ↳ With x items: if $x < N$, some PEs have to be deactivated
    if $x > N$, must loop

> Vector Processing: SIMD specialty
  ↳ typically require $N-1$ opcode fetches, decodes and operand loads