Morphable Multithreaded Memory Tiles (M3T)*
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**Impact**
- Influenced IBM CyclopsE chip with polymorphic support
- Sped up Sphinx speech processing about 2.5x through polymorphism
- Estimated 60x reduction in size, weight, and power per speech channel
- Estimated 20x reduction in cost per speech channel

**Templates**
- Provide routines required by application
- Use
  - generic: threads, C, C++, ...
  - specialized – (possibly architecture specific):
    - Brook, StreamIt, StreamC/Kernel, assembly
  - MPI, Corba?

**Streaming**
- Native mode for M3T/Cyclops
- GNU -- C/C++/Fortran
- Augmentation with superscalar possible
- MPI, Corba possible (not currently supported)

**Threaded**
- Use cache interest group coding as routing network
- Support SIMD via fast barrier
- Utilize thread units as imagine clusters
- Compiler/macro/template support needed

**Model**
- Architecture specific details:
  - ALU, memory, etc.
  - Template constraints
  - Application requirements
  - Optimization goals
  - System constraints
  - Tool choice structure

**New Ideas**
- M3T morphs into VLIW, MIMD and TaskScalar templates
- Polymorphism at every stage of the system
- M3T morphs on demand within application

**Builder/Runtime**
- Search design space based on models/templates
- Generate application framework (glue code) and configuration files within MSI constraints
- Utilize existing
  - Compilers/linkers based on template choice
  - Hardware specific morphware

**Compiler**
- Transformation based on three templates
  - MIMD, TaskScalar, VLIW
- Target to two morphable architectures
  - M3T, Cyclops
- Support automatic and manual parallelization

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