

VLoop in VeGen

1 Loop Related Files

There are three groups of files that are directly related to loops in VeGen: Vloop, LoopUnrolling, and UnrollFactor. Each group has a header file and a cpp file.

2 VLoop

2.1 Members

VLoop is built upon the original LLVM loop and contains a pointer to the original loop. It has references to two control conditions: one decides whether to execute the loop, and the other is the back edge condition, which is essentially the loop condition in C but contains a chain of conditions from the function entry.

VLoop also contains a reference to the VectorPackContext. We can see a design pattern here: an object often has references to its context and to other supportive data structures that belong to the context. Here, the context includes the GlobalDependenceAnalysis and the VLoopInfo (which is a friend class of VLoop). VLoop has bit vectors to store the instructions that depend on the loop and the instructions that are contained in the loop, as well as a reference to the subloops.

Some condition-related things are here. They are maps from phi nodes to mu nodes, from phi nodes to one-hot phis, and from phi nodes to lists of control conditions (Gated phis). An instruction has a guard value, which is the value that instructions outside of this loop should use. Also, there are conditions for each instruction.

2.2 Methods

3 LoopUnrolling

4 UnrollFactor