

PRUNERS

**Non-Deterministic
Bug**

ARCHER

Scalable and accurate
OpenMP data-race
detection

ReMPI

Scalable
record-and-replay
of MPI message
exchanges

NINJA

Smart noise injector
for quickly exposing
unintended MPI
message races

FLiT

Test framework for
revealing
compiler-induced
floating-point variability

Bug Fix

DEBUGGING + TESTING