# GEM: Graphical Explorer for MPI Programs

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## Abstract

Formal dynamic verification can complement MPI program testing by detecting hard-to-find concurrency bugs. In previous work, we described our dynamic verifier called ISP that can parsimoniously search the execution space of an MPI program while detecting important classes of bugs. One major limitation of ISP, when used by itself, is the lack of a powerful and widely usable graphical front-end. We present a new tool called Graphical Explorer of Message Passing (GEM) that overcomes this limitation. GEM is a plug-in architecture that greatly enhances the usability of ISP, and may help bring ISP within reach of a wide array of programmers, given its imminent release as part of the Eclipse Foundation Parallel Tools Platform (PTP) Version 3.0. This paper describes GEM's features, its architecture, and usage experience summary of the ISP/GEM combination. Recently, we applied this combination on a widely used parallel hypergraph partitioner. Even with modest amounts of computational resources, the ISP/GEM combination finished quickly, and intuitively displayed a previously unknown resource leak in this code-base.