

Behrends, Reimer; Konovalov, Alexander; Linton, Steve; Lübeck, Frank; Neunhöffer, Max
Towards high-performance computational algebra with GAP. (English) [Zbl 1294.68151](#)

Fukuda, Komei (ed.) et al., Mathematical software – ICMS 2010. Third international congress on mathematical software, Kobe, Japan, September 13–17, 2010. Proceedings. Berlin: Springer (ISBN 978-3-642-15581-9/pbk). Lecture Notes in Computer Science 6327, 58-61 (2010).

Summary: We present the project of parallelising the computational algebra system GAP. Our design aims to make concurrency facilities available for GAP users, while preserving as much of the existing codebase (about one million lines of code) with as few changes as possible without requiring users (a large percentage of which are domain experts in their fields without necessarily having a background in parallel programming) to have to learn complicated parallel programming techniques. To this end, we preserve the appearance of sequentiality on a per-thread basis by containing each thread within its own data space. Parallelism is made possible through the notion of migrating objects out of one thread's data space into that of another one, allowing threads to interact.

For the entire collection see [\[Zbl 1196.68008\]](#).

MSC:

[68W30](#) Symbolic computation and algebraic computation

Keywords:

[GAP](#); [shared memory programming](#); [threads](#); [data spaces](#)

Software:

[GAP](#)

Full Text: [DOI](#)