



Contribution ID: 32

Type: **Short talk**

Beyond 2D block-cyclic: extended patterns for distributed linear algebra

Tuesday 21 March 2023 15:40 (10 minutes)

The 2D block-cyclic pattern is a well-known solution to distribute the data of a matrix among homogenous nodes. Its ease of implementation and good performance makes it widely used.

With the increased popularity and efficiency of task-based distributed runtime systems, it becomes feasible to consider more exotic patterns. We have recently proposed improvements in two different contexts:

1. For symmetric operations, there exist patterns that take advantage of the symmetry of the matrix to reduce the communication volume.
2. When the number of nodes P cannot be expressed as $P = p \times q$ with close values of p and q , we can find patterns that use all the nodes while keeping optimal load balancing and low communication volume.

For each context, we showed that using an exotic pattern with an efficient runtime system yields increased performance. We believe these ideas can be explored further, for example: to improve the scheduling of communication operations, to extend to other operations, to consider non-homogeneous nodes, ...

JLESC topic

Primary authors: BEAUMONT, Olivier (Inria); EYRAUD-DUBOIS, Lionel (Inria); Prof. LANGOU, Julien (UC Denver); Dr VÉRITÉ, Mathieu (Inria)

Presenter: EYRAUD-DUBOIS, Lionel (Inria)

Session Classification: Short Talks on Numerical Methods

Track Classification: Numerical methods and algorithms