Second step of TER project
Some important StarPU features
Next

TER project - 2D tiling

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Matrix multiplication with 2D tiling

Matrix multiplication with 2D tiling

Doing a matrix multiplication taking into account possible transpositions, with A, B, and C tiled in 2D.

Note: full operation is $\mathcal{C} = \alpha \times \mathcal{A}^{N/T} \mathcal{B}^{N/T} + \beta \times \mathcal{C}$

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Matrix multiplication with 2D tiling

Matrix multiplication with 2D tiling

Important note: Matrix multiplication should still work for last weeks 1D case! In the presentation/report I expect comparisons between them.

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Tasks
Data management

Tasks

- StarPU permits to disable sequential consistency and manually specify dependencies
- Multiple approaches to wait for tasks to complete or data to be available
- Possibility to have multiple implementations of a kernel and choose according to capabilities of the machine or the problem requirements (codelet field `can_execute`)
- Tasks can be attributed to parallel workers using codelet field `type` and `max_parallelism` (this might be in part 2 of the TER)

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Tasks
Data management

Data management

- Resizing data handle buffers in tasks dynamically
- Data allocation using `starpu_malloc`
- Controlling StarPUs data caching
- Access data from data handle with `starpu_data_acquire` and release it to StarPU with `starpu_data_release`
- Prefetching with `starpu_data_idle_prefetch_on_node` (useful to exclude data transfer time from benchmarks)
- Possible to advise StarPU on data usage needs
- Custom data interfaces
- Multi-format interfaces
- Specifying the node in which data should be for a codelet

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Continue working on the TER project.

```
ssh qdcster_XX@chome.metz.supelec.fr
salloc --partition gpu_tp_resa --reservation M1QDCS_TERSTARPU13
       --exclusive --time 4:00:00
```

For next week read at least chapters 24, 25, 38 of the StarPU documentation
https://github.com/TER-StarPU/ter-starpu-gemm/blob/
main/docs/starpu-documentation.pdf