

2nd Call for Projects for Performance Engineering

Background: hpc.bw - High Performance Computing (HPC) in Research

In the digital era, High Performance Computing (HPC) is an essential building block for research and development. Combinatorial optimisation problems in logistics and production, numerical simulations in engineering or image processing and machine learning methods with real-time requirements are only three examples with high HPC relevance. For optimal support of your research projects, the Container-based High Performance Computing Center (CBRZ) HSUper at HSU is available.

The aim of the project hpc.bw is to strengthen innovative cross-location HPC research at the Universities of the Armed Forces and to foster the transfer of HPC know-how into the various disciplines in order to

- sustainably strengthen research and development in the respective disciplines,
- promote interdisciplinary exchange between HPC-related problems, and
- to explore and answer new HPC research questions from discipline-specific problem settings.

Further information: <https://dtecbw.de/home/forschung/hsu/projekt-hpcb>

Call for projects for performance engineering at the Universities of the Armed Forces

Projects for performance engineering are meant to enable computer-aided research, assessment of discipline-specific questions with the help of fast algorithms, implementations and software parallelization.

Project funding includes dedicated support in software implementation by research assistants (WMAs) within the framework of the hpc.bw project. Depending on the project, short visits (2-3 days) of the hpc.bw WMA to the applicant group in Munich/Hamburg are possible. **Projects must not exceed an anticipated duration of 12 months and 50% of the work time of the supporting hpc.bw WMA (or equivalently 6 full person months, respectively). If the volume of work is exceeded, the application can be rejected. The project start date is 03.04.2023.**

Note: Competent WMAs, who are already responsible for the hpc.bw project, will support your project. You cannot apply for other funds or WMA positions in this call!

We cordially invite ALL departments at the Universities of the Armed Forces to apply with HPC-relevant research proposals. In addition to outlines of individual research interests, there is also the possibility of submitting proposals for planned or existing research projects.

Please fill in the application form and submit it by **14.02.2023** via e-mail to info-hpc-bw@hsu-hh.de. Please direct any queries to the same address or to Prof. Philipp Neumann, Tel. 040/6541-2723. We look forward to your contributions!

Anticipated procedure 2023

- 14.02.23: **Submission of project outlines (see application form)**
- 14.02.23 - 05.03.23: **Review of the outlines** with regard to scientific relevance, sustainability, impact and feasibility by a panel (hpc.bw multipliers, project coordinator, external review);
- 06.03.23 - 20.03.23: **Selection of approx. 2-4 proposals** for support by hpc.bw
- Until 20.03.23: **Notification of all projects** on the outcome of the review
- Until 03.04.23: **Submission of title, abstract and points of contact** from positively evaluated projects for publication on the hpc.bw website
- 03.04.23 - 31.03.24: **Implementation of the projects:** Support of the applying group by a WMA of the hpc.bw project to achieve the Performance Engineering targets

Conditions associated with funding

- Willingness of the applicant group to provide material (slides, graphics, illustrative material, etc.) on their supported project at hpc.bw-relevant events
- Adequate consideration of hpc.bw in project-relevant scientific publications, lectures, etc. (acknowledgement, co-authorship, etc.)
- Until 3 months after project completion: preparation of a short summary (approx. 0.5 DIN A4 page) on the achieved project goals, current or expected impact (incl. abstract for the website of hpc.bw)

Application Form Performance Engineering: hpc.bw - High Performance Computing (HPC) in Research

General information

Project title:

Planned project duration:

Contact person:

E-mail:

Faculty:

Professorship:

If applicable, relation to funded research project (project title, funding institution):

1. Description of the research project

1.1 Outline the research project for which HPC is needed (approx. 4 lines).

1.2 How/why should HPC be used for the project (approx. 4 lines)?

2. When already known: Description of the existing software that is to be optimized by means of HPC (approx. 4 lines) (Examples: functionality, areas of application, programming language, parallelization approaches, code size)

3. hpc.bw support services in your project

3.1 What problems (if any) are currently present in your software (e.g. program too slow (runtime), memory consumption too high)? Can you quantify these (approx. 4 lines)? (Example: Halving the runtime is necessary to answer the research question)

3.2. What are the requirements for the software that is to be optimized, after the needed performance engineering has been carried out (approx. 4 lines)?
(Example: Software executable with data set XY; Software compatible with Windows/Linux)

3.3. In which area and to what extent do you need support from hpc.bw (approx. 4 lines)?(Example: algorithm development, ca. 1 person months; code optimization, ca. 2 person months; OpenMP/MPI parallelization, ca. 3 person months)

4. Self Assessment (Single-Choice): How familiar are you with HPC and programming?

- No knowledge (you only write individual lines of a program or have no experience with programming or optimized software)
- Basic knowledge (you write parts of programs yourself, e.g. larger Excel macros, Matlab scripts or interfaces to commercial software)
- Advanced knowledge (you write your own programs/parts of programs for parallelized execution on HPC computing systems)
- Expert knowledge (you parallelize and optimize your software mostly independently and have detailed knowledge of job scheduling systems such as SLURM or PBS)

Please submit the completed application form by 14.02.2023 to: info-hpc-bw@hsu-hh.de