

# Enabling Performance Engineering in Hesse and Rhineland-Palatinate (EPE)

Project Term  
2017 - 2019

Project Areas  
Computer Science

Project website  
[http://www.sc.informatik.tu-darmstadt.de/res/pro/epe/epe\\_overview/index.en.jsp](http://www.sc.informatik.tu-darmstadt.de/res/pro/epe/epe_overview/index.en.jsp)

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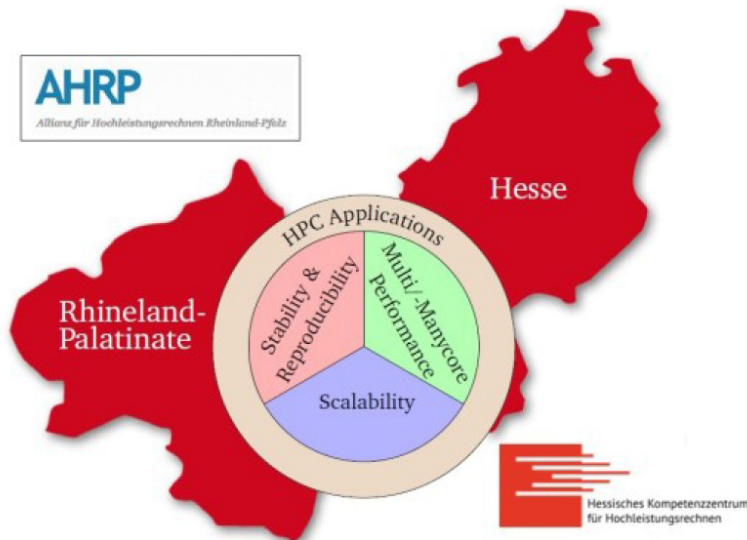
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## Introduction

**Objective:** Expand and deepen HPC support in areas where existing scientific expertise coincides with critical user needs.

**Approach:** Bundle the distributed expertise for HPC support and performance engineering within the HKHLR and the AHRP under a new umbrella to support scientists to efficiently use the HPC resources in Hesse and Rhineland-Palatinate.

[DFG-Gepris Website](#)

## Methods

Performance Engineering Services:

Within our project, we design and provide the following portfolio of consulting services:

### Scalability

- Objective: Help developers identify and resolve scalability limitations in their codes
- Approach: Define services with increasing degrees of applications engagement around Extra-P, an automatic

performance-modeling tool developed at TU Darmstadt

### Stability, Performance, and Reproducibility

- Objective: Help developers understand the impact of changes to specific parts of algorithms, especially the exchange of libraries and architectures.
- Approach: Measure condition numbers of algorithms with the help of algorithmic differentiation, by leveraging the tools Code Differentiation Package (CoDiPack) and Message Differentiation Package (MeDiPack) of TU Kaiserslautern. Package run-time environments either in containers or virtual machines.

### Multi-/Manycore Performance

- Objective: Help developers to use multi-/manycore architectures more effectively
- Approach: Identify applications that make intensive use of multi-/manycore architectures and suggest optimizations while maintaining portability

### Support Structures

- Provide local support staff as point of contact for the above services
- Organize workshops, tutorials, and coding weeks for interested HPC users in Hesse and Rhineland-Palatinate

## Reference

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