Innovation and Global Cooperation for Sustainability
12-14 March, 2024

Hardware-aware Algorithms in Scientific Computing

DAAD

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1. Partners

Lead institutions:
- Department of Computational and Data Sciences (CDS) at Indian Institute of Science (IISc), Bengaluru
- Interdisciplinary Center for Scientific Computing, Heidelberg University

Associated Partners:
- Jülich Supercomputing Center, Forschungszentrum Jülich
- Centre for Applicable Mathematics, Tata Institute for Fundamental Research, Bengaluru

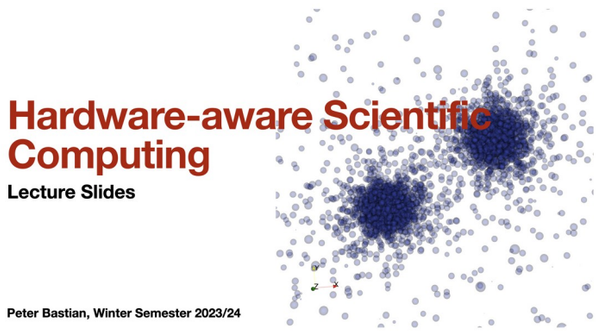
Industrial Partner:
- NVIDIA India

2. Goals

1. Train a new generation of students on master and Ph.D. level, who are both fluent in state-of-the-art efficient numerical methods as well as hardware-aware design and implementation of these algorithms,
2. Build up a leading network of researchers in India and Germany in high-performance scientific computing,
3. Establish collaboration on joint research projects among the project partners with the long term perspective
4. Establish a cotutelle Ph.D. program between Heidelberg University and IISc and
5. Thus strengthen the international profile of the participating institutions.

2. Teaching

- We designed a lecture on Hardware-aware Scientific Computing
- This lecture was held several times at IISc and Heidelberg University



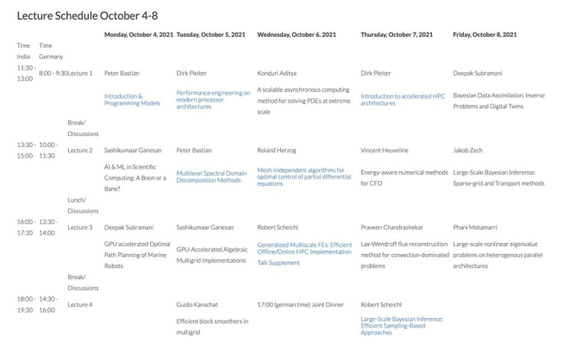
3. Exchange

- Covid severely hampered traveling until Fall 2022
- Prof. Peter Bastian visited CDS (2 weeks in 2022)
- Ph.D. Santiago Ospina visited CDS (2 months in 2022)
- One german master student spent one semester at CDS in 2023
- Two more students from Germany will go for the period August-December, 2024

References:
https://conan.iwr.uni-heidelberg.de/haasc/

4. Workshops & Schools

Summer School on Hardware-aware Scientifc Computing organized by IWR



- October 4-15, 2021
- Online Format due to Covid
- One week of lectures
- One week of mini projects
- 12 speakers
- 70 registered participants

Indo-German conference on Computational Mathematics (IGCM-2023) organized at CDS
https://cmg.cds.iisc.ac.in/igcm/

- March 27-30, 2023
- 12 invited presentations
- 58 contributed presentations
- 100 registered participants

Workshop planned in Heidelberg, October 28-30, 2024

5. Institutional Collaboration

Our goal is to sign a Memorandum of Understanding between CDS and IWR in 2024 to sustain the cooperation

MEMORANDUM OF UNDERSTANDING
BETWEEN

DEPARTMENT OF COMPUTATIONAL AND DATA SCIENCES, INDIAN INSTITUTE OF SCIENCE
AND
INTERDISCIPLINARY CENTER FOR SCIENTIFIC COMPUTING
HEIDELBERG UNIVERSITY, GERMANY

The Department of Computational and Data Sciences (CDS), Indian Institute of Science, and the Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University, Germany conclude this Memorandum of Understanding (MoU) in recognition of mutual benefits arising from the establishment of effective academic relations. The purpose of this agreement is to promote scientific relations through academic collaboration between both institutions.