

## PARALLELIZATION, OPTIMIZATION AND DEBUGGING IN HIGH PERFORMANCE COMPUTING

UNIVERSITY COURSE

2019



Head	 <p><b>Univ.-Prof. DI Dr. Thomas Fahringer</b> Department of Computer Science</p>  <p><b>Philipp Gschwandtner,</b> MSc PhD Department of Computer Science</p>
Duration / Credits	3 days / equals 1 ECTS-Credit
Location	University of Innsbruck
Start	30 <sup>th</sup> September 2019
Course Fee	€ 300.-
Website	<a href="http://www.uibk.ac.at/fz-hpc">www.uibk.ac.at/fz-hpc</a>
Contact	<b>Philipp Gschwandtner, MSc PhD</b> Tel.: +43 512 507-53233 <a href="mailto:philipp.gschwandtner@uibk.ac.at">philipp.gschwandtner@uibk.ac.at</a>
Enrolment	<a href="http://bit.ly/hpc_ibk">http://bit.ly/hpc_ibk</a> Division of Continuing Education Christina Brückl Innrain 52f, 6020 Innsbruck Tel.: +43 512 507-39402 <a href="mailto:weiterbildung@uibk.ac.at">weiterbildung@uibk.ac.at</a>

# PARALLELIZATION, OPTIMIZATION AND DEBUGGING IN HIGH PERFORMANCE COMPUTING

## Target Group

The target audience includes pre- and postdoc researchers at the University of Innsbruck, who require high computational power or performance-oriented programming for their scientific problems; furthermore, employees working at companies with high computational needs or complex problems that require parallelization; in addition, depending on registration numbers, master students of relevant curricula (e.g. Computer Science, Mathematics).

## Qualification Profile

Graduates are qualified to devise parallel programs for their scientific problems in academia and industry and produce high-quality implementations. They are able to evaluate several programming model and hardware architecture candidates, consider the respective advantages and disadvantages of each technology with regard to their specific use case, and choose the best option for realization.

Moreover, they are qualified to optimize their parallel programs analytically and empirically with regard to the specific properties of both their scientific problem and the chosen technologies in order to ensure high performance and efficiency.

## Requirements

Basic programming skills in C, C++ or Fortran are required, as well as working knowledge of Linux/Unix commands.

## Content

### High Performance Programming with Message Passing Interface (MPI)

The participants learn to design, implement and optimize parallel programs using the MPI programming model for their own use cases in academia and industry. They study several approaches to solving a problem with MPI and selecting the best option with regard to performance, communication overhead, readability, and maintainability.

## Language

The course will be taught in English.

## Duration

The university course runs for three days from 30<sup>th</sup> September to 02<sup>nd</sup> October 2019 in each case from 9 am to 5 pm.

## Qualification

Certificate from the University of Innsbruck