

PUBLIC LECTURE EVALUATION

Masaryk University

Faculty	Faculty of Informatics
Procedure field	Informatics
Applicant	RNDr. Jiří Filipovič, Ph.D.
Lecture date	11. 4. 2024
Lecture topic	What can we expect from code performance optimization?
Persons present	35
Designated evaluators (board members)	prof. RNDr. Ivana Černá, CSc. doc. Ing. Jiří Jaroš, Ph.D. prof. Ing. Pavel Zezula, CSc.

The lecture delved into source optimization, using a concrete example of optimizing source code for CPU and GPU hardware.

In the first part, focusing on CPU optimization, the lecturer demonstrated techniques such as optimizing for cache usage, enhancing temporal locality, improving code vectorization, and implementing loop tiling. These methods were illustrated using the example of an Electrostatic Potential Map.

Transitioning to GPU optimization in the second part, the discussion centred on techniques like optimizing memory access patterns and minimizing divergence to enhance GPU performance.

In the third part, the concept of performance portability was explored. It was emphasized that there is no universal solution for optimization, highlighting the importance of autotuning to adapt implementations for different architectures.

Throughout the lecture, concrete examples were used to illustrate each optimization technique, leading to a deeper understanding of how source optimization can significantly improve computational performance across various hardware platforms. Discussions also touched on generalizations and results in the optimization domain, underscoring the broader implications of these techniques beyond the specific examples presented.

Conclusion

The lecture delivered by RNDr. Jiří Filipovič, Ph.D., entitled “What can we expect from code performance optimization?” and delivered as part of the habilitation procedure, **demonstrated** sufficient scholarly qualifications and pedagogical capabilities expected of applicants participating in a habilitation procedure in the field of Informatics.

Date: 11. 4. 2024

prof. RNDr. Ivana Černá, CSc.

doc. Ing. Jiří Jaroš, Ph.D.

prof. Ing. Pavel Zezula, CSc.

