

Inspiring Students to Work at Technology's Cutting Edge

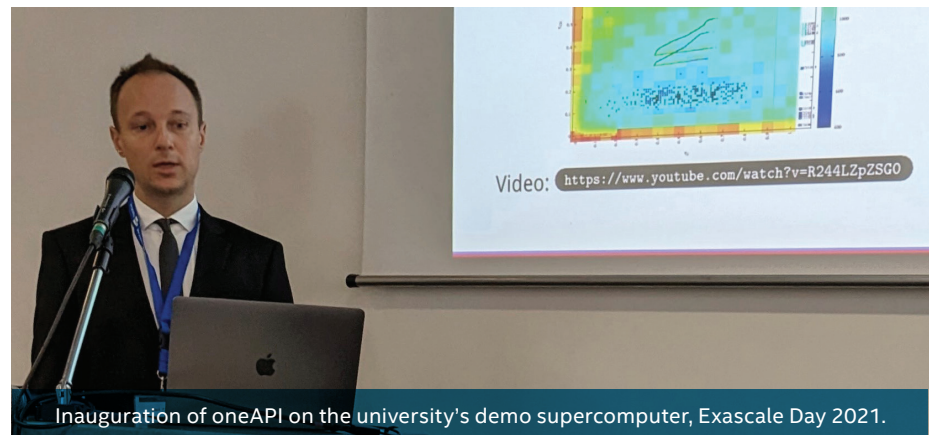
The University of Maribor is helping advance the scope of the possible with evolutionary AI algorithms that solve problems by emulating biological natural selection. Resources and support from the Intel® Academic Program for oneAPI help advance this vision, giving students the tools and training to harness supercomputer power for the next generation of innovation.



The accelerating pace of technology change places constant pressure on a university's ability to train developers on the very newest topics. In just a few short years, students must become proficient with mainstream programming subjects while also preparing to break new ground with those yet to come. Professors must strive to see that leading edge clearly, capture it and build it into a curriculum that pays forward to their students.

At the University of Maribor in Slovenia, Associate Professor Aleš Zamuda applies that vision to advance training in next-generation AI algorithms on high-performance computing clusters. Dr. Zamuda is on the University's Faculty of Electrical Engineering and Computer Science, Institute of Computer Science, Computer Architecture and Languages Laboratory. His research, funded by the University as well as Slovenian and EU programs, applies his computer science and informatics background to evolutionary AI algorithms. This class of logic tests potential solutions to a problem against each other and arrives at conclusions using a "survival of the fittest" approach.

On top of foundational computer science topics such as C++, assembly, MPI and Hadoop, Dr. Zamuda introduces his students to programming concepts for massively parallel heterogeneous systems drawing on the Intel Academic Program for oneAPI. Students have outstanding hands-on resources for this work, including Intel® Developer Cloud and the university's demo supercomputer named "Maister," which announced running oneAPI on October 18, 2021 (observed as Exascale Day for the number 10^{18}). Dr. Zamuda is expanding oneAPI's reach further with a planned conference and student events on-premises at the university's larger supercomputer (EuroHPC Vega).



Inauguration of oneAPI on the university's demo supercomputer, Exascale Day 2021.

"Incorporating oneAPI and Intel® Developer Cloud into subjects like Parallel and Distributed Computing makes the subjects especially attractive. With oneAPI, my students can experience the full potential of a processor."

- Associate Professor Aleš Zamuda, University of Maribor

Igniting the future of expertise and invention

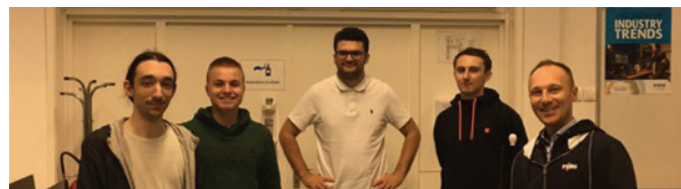
To power both his lab and his classroom with the latest emerging technologies, Dr. Zamuda observes a continuum between his roles as learner and teacher. He summarizes that approach, "I like to learn how technology works, contribute to scientific research, and give back by teaching students about it." The formulation depends on capturing the imaginations of students, so Dr. Zamuda tends to seek out a small, interested group of advanced, curious students first, to lead the way among their peers.

The Intel Academic Program for oneAPI provides a rich set of resources to introduce simple tasks initially, followed by gradually more advanced ones. His advice on taking full advantage of the Program in this effort includes, "Do not forget to include tasks that show the full potential of oneAPI to students and upgrade their programming capabilities." He also advises having slides and other resources from the Program at the ready to teach students about oneAPI and how to access the workspaces for executing learning tasks.

Resources that drive teachability

The unique value of the Intel Academic Program for oneAPI [Educator Program](#) is in its comprehensive approach. The oneAPI platform itself provides a robust programming environment for heterogeneous systems such as supercomputers. It brings together the spectrum of Intel's software development tools and libraries to create a single code base that runs across CPUs, GPUs and accelerators. It offers students access to performance speedups typically achievable only by advanced experts.

Ready-to-use oneAPI course materials enable Dr. Zamuda to add slides, assignments and quizzes for new topics to the curriculum quickly, making his coursework more responsive to evolving technology. Together with the videos provided by the Program, these resources act as a knowledge bank that is continuously updated and maintained in the cloud for anytime access. Likewise, Intel Developer Cloud gives students free access to a world-class virtual workspace based on the latest hardware and software.



1 oneAPI: Programming for the New Era of Heterogeneous Computing

Hardware accelerators are critical for maximizing throughput and energy efficiency while driving down workload latency and cost on commercial-off-the-shelf (COTS) servers. Developers have used performance engines such as GPUs and FPGAs to supplement the CPU for years, although proprietary programming models such as CUDA have limited the reach of those efforts.

oneAPI changes all that, with a single, open model for code that can execute on CPU cores as well as various hardware accelerators. [Intel oneAPI toolkits](#) provide best-in-class compilers, performance libraries, frameworks and analysis and debug tools, so developers can code once and run anywhere, from the largest supercomputers to compute nodes on the distributed edge.

Looking ahead, Dr. Zamuda will continue inspiring his students to innovate beyond the horizon, with a commitment to open standards computing and cross-platform software development. The Intel Academic Program for oneAPI Educator Program will be a core ally for him in that work.

Learn More:

[Intel® Academic Program for oneAPI](#)



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