

Building Student Expertise to Program Heterogeneous Systems

The School of Software and Microelectronics, Peking University, draws on resources and support from the Intel® Academic Program for oneAPI to help teach programming for heterogeneous systems. Yuejian Fang, an Associate Professor at the school, uses this relationship to build enthusiasm and programming expertise across disciplines, advancing the university's mission and preparing students for professional success.



Students matriculating through engineering and other technical programs have just a few short years to build the skills they need to launch professional careers. In addition to hard work on the parts of both students and faculty, success depends on the right choices among learning institutions when adopting leading-edge, forward-looking technologies, tools and techniques. At Peking University, a top university in Asia, the School of Software and Microelectronics teams with the Intel Academic Program for oneAPI to help navigate this set of requirements.

Professor Yuejian Fang focuses on confidential computing, artificial intelligence and blockchain as research and teaching disciplines, with multiple patents in China and the US. The primary classes Professor Fang teaches include C programming and AI application development.



School of Software and Microelectronics, Peking University.

Professor Fang takes a pragmatic view when choosing new technologies to introduce to students, finding intersections between student interest, the university's mission, and the technology's value from the perspectives of knowledge acquisition and skills training. oneAPI meets this combination of criteria by preparing students with programming skills for the era of heterogeneous and accelerated computing. The Intel Academic Program for oneAPI [Educator Program](#) provides teaching content through oneAPI teaching kits. These resources help clarify the material being taught, make life easier for the professor teaching it and inspire the students learning it.

“System heterogeneity is a trend now, and programming in a heterogenous architecture world is difficult. oneAPI as a unified programming model can dramatically simplify developer efforts to write software for the system, while reducing the programming complexity.”

- Yuejian Fang, Associate Professor, School of Software & Microelectronics, Peking University

Engaging and Preparing Students for Rewarding Careers

Intel’s involvement as an industry leader in the academic sphere offers a clear message of opportunity to Professor Fang’s students. Course participants are enthusiastic to be trained on future-facing heterogeneous programming technologies, which gives them an advantage in their professional careers, in keeping with the university’s mission.

Professor Fang finds a great deal of value in oneAPI teaching kit materials provided by Intel. Using the teaching kits in class offers a good balance of theoretical preparation with hand-on programming experience, preparing students with substantial depth as well as breadth of understanding and experience. The content within the kits is polished and effective, with Professor Fang having developed Chinese-language curriculum, helping to ignite interest and motivation among students as part of the broader effort to maximize student engagement. The Chinese DPC++/SYCL curriculum from Professor Fang is also available on GitHub.

Students experiment and innovate in the hands-on DevCloud development environment, with some submitting new project ideas to the DevMesh developer community that build on course materials and guides. The hands-on, participatory nature of this involvement advances Professor Fang’s philosophy of personalizing the learning experience to make it more immediate and impactful for each student. Many pursue further involvement through the [Intel Student Ambassador Program for oneAPI](#), another opportunity provided by the Intel Academic Program for oneAPI. The community of collaboration based on open technology and shared purpose empowers students for the future.

Meeting the Ongoing Opportunity

After the success of teaching and workshops based on the Intel Academic Program for oneAPI, Professor Fang plans to incorporate content from the oneAPI Introduction to Machine Learning into the curriculum, within the “Artificial Intelligence Application Development” course. This integration gives students direct access into the hardware and software technologies driving the future of heterogeneous computing. The strong connection between industry and academia enables a workforce that is well prepared to power ongoing innovation.



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Engineering students at Peking University.

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.

Learn more:

[Intel Academic Program for oneAPI](#)