PARALLEL COMPUTING APPROACH TO INCREASE PROCESSING SPEED

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ANNOTATION

Parallel computing is a type of computation in which many calculations or processes are carried out simultaneously. Large problems can often be divided into smaller ones, which can then be solved at the same time. There are several different forms of parallel computing: bit-level, instruction-level, data, and task parallelism. Parallelism has long been employed in high-performance computing, but has gained broader interest due to the physical constraints preventing. As power consumption (and consequently heat generation) by computers has become a concern in recent years, parallel computing has become the dominant paradigm in computer architecture, mainly in the form of multi-core processors.

Key words: parallel computing, bit-level, often conflated, dominant paradigm

INTRODUCTION

Parallel computing is closely related to concurrent computing—they are frequently used together, and often conflated, though the two are distinct: it is possible to have parallelism without concurrency, and concurrency without parallelism (such as multitasking by time-sharing on a single-core CPU). In parallel computing, a computational task is typically broken down into several, often many, very similar sub-tasks that can be processed independently and whose results are combined afterwards, upon completion. In contrast, in concurrent computing, the various processes often do not address related tasks; when they do, as is typical in distributed computing, the separate tasks may have a varied nature and often require some inter-process communication during execution.

Parallel computers can be roughly classified according to the level at which the hardware supports parallelism, with multi-core and multi-processor computers having multiple processing elements within a single machine, while clusters, MPPs,

and grids use multiple computers to work on the same task. Specialized parallel computer architectures are sometimes used alongside traditional processors, for accelerating specific tasks.

In some cases parallelism is transparent to the programmer, such as in bit-level or instruction-level parallelism, but explicitly parallel algorithms, particularly those that use concurrency, are more difficult to write than sequential ones, because concurrency introduces several new classes of potential software bugs, of which race conditions are the most common. Communication and synchronization between the different subtasks are typically some of the greatest obstacles to getting optimal parallel program performance.

Computing is any goal-oriented activity requiring, benefiting from, or creating computing machinery. It includes the study and experimentation of algorithmic processes, and development of both hardware and software. Computing has scientific, engineering, mathematical, technological and social aspects. Major computing disciplines include computer engineering, computer science, cybersecurity, data science, information systems, information technology and software engineering.

The term "computing" is also synonymous with counting and calculating. In earlier times, it was used in reference to the action performed by mechanical computing machines, and before that, to human computers.

Traditionally, computer software has been written for serial computation. To solve a problem, an algorithm is constructed and implemented as a serial stream of instructions. These instructions are executed on a central processing unit on one computer. Only one instruction may execute at a time—after that instruction is finished, the next one is executed.

Parallel computing, on the other hand, uses multiple processing elements simultaneously to solve a problem. This is accomplished by breaking the problem into independent parts so that each processing element can execute its part of the algorithm simultaneously with the others. The processing elements can be diverse

REFERENCES

1. Mirzaeva M. K. SAMARKAND IS THE CRADLE OF EASTERN SPIRITUALITY AND ITS PLACE IN THE DEVELOPMENT OF WORLD SCIENCE //PalArch's Journal of Archaeology of Egypt/Egyptology. – 2020. – Т. 17. – №. 9. – С. 188-196.

2. Mavlanovna A. M., Kurbanovna M. M. Socio-philosophical problems of culture and marginal spirituality //Academicia: An International Multidisciplinary Research Journal. – 2021. – Т. 11. – №. 3. – С. 2579-2583.

3. Oxojonovich A. S., Usmoilovich A. Y. About the Problems of Language Teaching to Little Children //International Journal of Culture and Modernity. – 2022. – Т. 14. – С. 30-34.

4. Асраев З. Р. LMS MOODLE ДАН ФОЙДАЛАНИБ «АМАЛИЙ МЕХАНИКА» КУРСИНИ ЎҚИТИШДА ТАЛАБАЛАРНИНГ ЎЗ-ЎЗИНИ РИВОЖЛАНТИРИШИНИ ФАОЛЛАШТИРИШ //Academic research in educational sciences. – 2020. – №. 4. – С. 114-123.

5. Асраев З. Р. ПЕРСПЕКТИВЫ ПРИМЕНЕНИЯ ИННОВАЦИОННЫХ ОБРАЗОВАТЕЛЬНЫХ ТЕХНОЛОГИЙ ПРИ ОБУЧЕНИИ ПРИКЛАДНОЙ МЕХАНИКИ //Образование и проблемы развития общества. – 2021. – №. 4 (17). – С. 22-27.

6. Rizakulovich A. Z., Salimovich B. N. Applications of Computer Technologies in Teaching Applied Mechanics //Eurasian Journal of Engineering and Technology. – 2022. – Т. 6. – С. 26-31.

7. Yuldashev, Kh, et al. "Modern catalyst based on cerium oxide." ISJ Theoretical & Applied Science 11.103 (2021): 940.

8. Ортикова С. С., Жураев А. И. У., Нурматова З. Н. К. Исследование водонерастворимой части аммофосфата на основе фосфорнокислотной переработки забалансовой фосфоритной руды Центральных Кызылкумов //Universum: химия и биология. – 2019. – №. 12 (66). – С. 59-61.

9. Юлдашев Х. Х., Жураев А. И. У., Рахмонов О. К. Методы получения гексафторсиликата натрия из отходящих газов производства фосфорных удобрений (обзор) //Universum: технические науки. – 2020. – №. 8-3 (77). – С. 63-67.

10.   Nazikhovna G. Y. Strengthening the Integrated Steam of Technologies in the Environment of Information Technologies and Computer Programs //Texas Journal of Multidisciplinary Studies. – 2022. – Т. 8. – С. 72-80.

11.   To'rayeva G. Ethnography of the peoples of Central Asia in the late XIX and early XX centuries on the example of Russian oriental studies //ЦЕНТР НАУЧНЫХ ПУБЛИКАЦИЙ (buxdu. uz). – 2020. – Т. 6. – №. 2.

12.   ТУРАЕВА Г. Ш., ДЖУРАЕВ Х. Ф. АВТОМАТИЧЕСКОЕ СИСТЕМЫ УПРАВЛЕНИЯ ПРОЦЕССА ЗАМЕСА ТЕСТА НА ОСНОВЕ ИКС //Будущее науки-2015. – 2015. – С. 329-332.