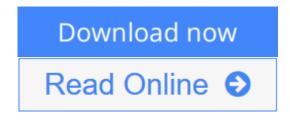# Mastering C++ Multithreading

By Maya Posch

Mastering C++ Multithreading By Maya Posch

Key Features

- Delve into the fundamentals of multithreading and concurrency and find out how to implement them
- Explore atomic operations to optimize code performance
- Apply concurrency to both distributed computing and GPGPU processing

Book Description

Multithreaded applications execute multiple threads in a single processor environment, allowing developers achieve concurrency. This book will teach you the finer points of multithreading and concurrency concepts and how to apply them efficiently in C++.

Divided into three modules, we start with a brief introduction to the fundamentals of multithreading and concurrency concepts. We then take an in-depth look at how these concepts work at the hardware-level as well as how both operating systems and frameworks use these low-level functions.

In the next module, you will learn about the native multithreading and concurrency support available in C++ since the 2011 revision, synchronization and communication between threads, debugging concurrent C++ applications, and the best programming practices in C++.

In the final module, you will learn about atomic operations before moving on to apply concurrency to distributed and GPGPU-based processing. The comprehensive coverage of essential multithreading concepts means you will be able to efficiently apply multithreading concepts while coding in C++.

What you will learn

- Deep dive into the details of the how various operating systems currently implement multithreading
- Choose the best multithreading APIs when designing a new application
- Explore the use of mutexes, spin-locks, and other synchronization concepts and see how to safely pass data between threads

- Understand the level of API support provided by various C++ toolchains
- Resolve common issues in multithreaded code and recognize common pitfalls using tools such as Memcheck, CacheGrind, DRD, Helgrind, and more
- Discover the nature of atomic operations and understand how they can be useful in optimizing code
- Implement a multithreaded application in a distributed computing environment
- Design a C++-based GPGPU application that employs multithreading

About the Author

Maya Posch is a software engineer by trade and a self-professed electronics, robotics, and AI nut, running her own software development company, Nyanko, with her good friend, Trevor Purdy, where she works on various game development projects and some non-game projects. Apart from this, she does various freelance jobs for companies around the globe. You can visit her LinkedIn profile for more work-related details.

Aside from writing software, she likes to play with equations and write novels, such as her awesome reimagining of the story of the Nintendo classic, Legend of Zelda: Ocarina of Time, and the survival-horror novel she recently started, Viral Desire. You can check out her Scribd profile for a full listing of her writings.

Maya is also interested in biochemistry, robotics, and reverse-engineering of the human body. To know more about her, visit her blog, Artificial Human. If there's anything she doesn't lack, it has to be sheer ambition, it seems.

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Editorial Review

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