

OOP, C++, and Verification

C H A P T E R 3

Progress has not followed a straight ascending line, but a spiral with rhythms of progress and retrogression, of evolution and dissolution.

Johann Wolfgang von Goethe

This chapter looks at why and how object-oriented programming was developed, and reflects on why OOP is the right choice for managing the increasing complexity of verification. It then shows how OOP is expressed in C++. The OOP techniques shown in this chapter are used throughout the remainder of this handbook.

Overview



OOP is a programming technique that is often touted as a cure-all for verification. While it is true that OOP is an essential tool in a programmer’s toolbox, it is by no means the most important one. One’s experience, intelligence, and team environment are far more important to the success of verification than any language feature or technique. That said, OOP is a useful tool for communicating and enforcing design intent for large projects and teams, in addition to being a good way to build adaptable and maintainable code.

This handbook is intended for those with at least some familiarity with OOP. Many verification engineers already have some experience with OOP through languages such as Vera, Specman, SystemVerilog, or SystemC.

The first part of this chapter looks at the history of OOP and why it is well-suited to functional verification. The second part shows how C++ expresses the most common elements of OOP.

For readers with limited experience in OOP, there are several suggestions at the end of this chapter. If you have some, but limited, experience with OOP, or if some time has passed since you used it last, then *don’t worry!*

Some of the aspects presented in this and subsequent chapters might seem confusing at first, but the main part of this handbook shows a complete working verification environment. It is the authors’ hope and intent that you will “copy and paste” from this environment as well as from the examples provided. This handbook is designed to give you a jump start on using C++ for verification without having to design every class from scratch.

The “basic” OOP techniques expressed in this chapter are the foundation of the techniques used and discussed throughout the remainder of this book.

