



CASE STUDY

University of Hull  
Educates Students  
in Software Development  
Using Parasoft C/C++test

## OVERVIEW

University of Hull in the United Kingdom is a place to develop yourself personally, socially, and academically. The University has more than 16,000 students and around 2,500 employees that include more than 1,000 academic staff. The computer science research was ranked joint fifth in the UK for impact in the last national assessment. Specialist areas include computational science, computer gamification, dependable intelligent systems, robotics and AI, and simulation and visualization.

At University of Hull, the department of Computer Science has a reputation for producing graduate software developers who can quickly cross the gap between academia and the workplace. They make immediate and effective contributions, which doesn't happen by accident.



## THE STRATEGY & GOAL

Senior lecturer, Warren Viant, approached Parasoft's European sales director about using Parasoft C/C++test in undergraduate and postgraduate teaching labs. The goal was to ensure that students graduate with the software development best practices used by companies producing today's software.

That was nearly a decade ago. The University of Hull continues to use Parasoft C/C++test today. The testing solution for C/C++ software development offers unit testing, structural code coverage, and other testing practices.

At University of Hull, Parasoft C/C++test gives students the ability to comprehensively test their C and C++ applications with industry standards like MISRA, AUTOSAR, C++ 14, CERT, and others. Aerospace, automotive, rail, medical, industrial, and many other industries use the coding rules and directives defined by these standards to help produce robust code. That means safe, secure, and reliable code.

Mr. Warren Viant personally values Parasoft C/C++test most for its built-in support of all the rules defined in three of his favorite books:

- » [Effective C++](#)
- » [More Effective C++](#)
- » [C++ Core Guidelines](#)

The books cover rules and best practices identified in the software industry over the past 20 to 30 years of C++ software development, which Parasoft C/C++test supports.

All the rules and directives that Parasoft supports are leading edge industry standards, which are a cumulation of user experiences and best practices from foremost software development companies, component suppliers, engineering consultancies, and academia around the world, over many decades.

## APPROACH

The students at University of Hull who use Parasoft C/C++test include:

- » Second years pursuing a Bachelor of Science (BSc) degree for software development.
- » Those pursuing an advanced software engineering education in the Master of Science in Engineering (MSc/MEng) program.

There are three software development themes or branches of education at University of Hull:

- » Robotics (the newest branch)
- » Standard industry software developer
- » Games developer

Mr. Warren Viant teaches the general class across all three domains and uses Parasoft C/C++test as part of the introduction to software development in C++.

*All the rules and directives that Parasoft supports are leading edge industry standards, which are a cumulation of user experiences and best practices from foremost software development companies, component suppliers, engineering consultancies, and academia around the world, over many decades.*



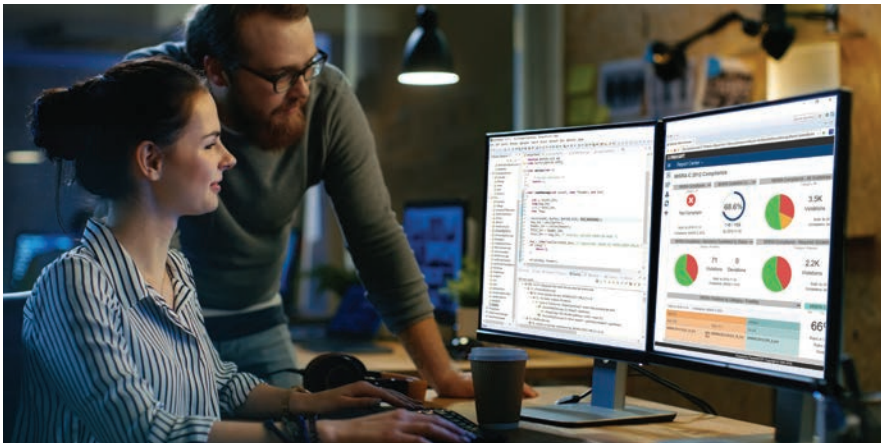
One of the reasons why the curriculum includes Parasoft C/C++test is the value that static code analysis brings to his students. The C/C++test static code analysis tool offers customizable rules coupled with a professionally written explanation of each rule and crucial examples of both failing and corrected code.

*The feedback Parasoft C/C++test provides is instrumental for students learning C++.*

A handpicked coding ruleset aligns with the curriculum and each student uses Parasoft C/C++test throughout the development period to complete their assignments. The feedback Parasoft C/C++test provides is instrumental for students learning C++. They receive information explaining exactly why the code is written poorly and examples of how to correct it.



From the student perspective, Parasoft C/C++test provides an automated personalized critique of their code – when and as often as they require. If their code fails a test, they can view a detailed explanation of why it failed and how to fix it with a single click. Important for educational purposes, the errors are not automatically fixed. Instead, students are forced to learn the reasons why each coding error exists. It teaches them coding best practices so they don't make the errors again when they're out in the employed world.



Another interesting learning aspect for students striving to create robust code is the skill of balancing time spent improving code quality versus time spent adding additional

functionality. At the end of the day, Mr. Warren Viant and the University of Hull are preparing professional software developers with an awareness that time is money and to use their time efficiently.

*Mr. Warren Viant highly rates and seriously recommends the use of Parasoft C/C++test and its static code analysis capabilities.*

The University of Hull's objective is to produce graduates that can make an effective and immediate contribution to the workplace as software developers. The more he can educate the students on the correctness of code and expose them to professional toolsets, like Parasoft C/C++test, the better for the future employers, employees, and beneficiaries of the vast products and software systems deployed around the world.

In all, Mr. Warren Viant highly rates and seriously recommends the use of Parasoft C/C++test and its static code analysis capabilities as an educational tool. He encourages other universities around the world to adopt Parasoft C/C++test and integrate it into their development modules. Especially if they use the testing tool in the manner deployed at University of Hull.

*Parasoft C/C++test offers suggestions on how to fix coding violations.*

## CHALLENGES PARASOFT C/C++TEST ADDRESSES

Prior to COVID 19, Mr. Warren Viant taught 150 to 200 undergrad students in labs split into two blocks with nearly 100 students in each one. Additionally, two staff members and several post graduate demonstrators walked around the labs to provide assistance.

Even with a cohort, it's impossible to offer nearly 100 software development students large amounts of individual feedback when their work gets flagged with coding violations. Compared to a compiler, it's especially helpful that Parasoft C/C++test offers suggestions on how to fix coding violations. This capability offloads many of the routine questions regarding correctness of code. It frees time for Mr. Warren Viant to provide guidance on more tricky areas of the curriculum.



## RESULTS

Mr. Warren Viant thanks Parasoft for their generosity and contribution to academia and the software industry. They provide a real workplace tool to educate and prepare our future software developers to make a difference in the world.

Graduates take on job opportunities in all industries where code needs to be of high quality: gaming, robotics, automotive, aerospace, defense, medical, railway, and more. The use of Parasoft C/C++test along with our curriculum continues to help the Department of Computer Science at University of Hull to sustain a reputation for producing some of the best and brightest software developers.

"MISRA", "MISRA C" and the triangle logo are registered trademarks of The MISRA Consortium Limited.  
©The MISRA Consortium Limited, 2021. All rights reserved.

## TAKE THE NEXT STEP

Build quality, reliability, and security into your software development process from the beginning. Download the [Getting Started With Static Analysis](#) whitepaper.

### ABOUT PARASOFT

[Parasoft](#) helps organizations continuously deliver quality software with its market-proven, integrated suite of automated software testing tools. Supporting the embedded, enterprise, and IoT markets, Parasoft's technologies reduce the time, effort, and cost of delivering secure, reliable, and compliant software by integrating everything from deep code analysis and unit testing to web UI and API testing, plus service virtualization and complete code coverage, into the delivery pipeline. Bringing all this together, Parasoft's award winning reporting and analytics dashboard delivers a centralized view of quality enabling organizations to deliver with confidence and succeed in today's most strategic ecosystems and development initiatives – cybersecure, safety-critical, agile, DevOps, and continuous testing.