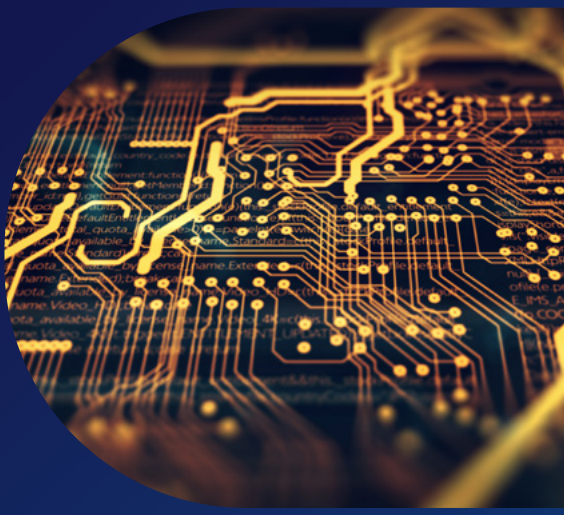
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Computer Systems Engineering

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Computer Systems Engineering utilises both software and hardware knowledge to design, develop, and build the smart products that are ubiquitous in our society.

Offered by our Department of Electrical, Computer, and Software Engineering, this specialisation may suit you if you enjoy coding, electronics, mathematics, mechanical technologies, and physics.

Te Herenga Auaha, Faculty of Engineering and Design

COMPUTER ARCHITECTURE AND MICROCONTROLLERS

Having in-depth knowledge of modern computer systems architecture permits you to optimise application-specific hardware and software. You'll explore various aspects of hardware/software interfaces, memory systems, and systems architecture by learning the internal design of advanced modern processors such as the Graphics Processing Units and multi-core processors used in smartphones, gaming consoles and data servers.

EMBEDDED SYSTEMS DESIGN

The cyber-physical systems for real-time, safety-critical applications like robotics, automotive products, medical devices and industrial automation systems require a thorough understanding of modelling concurrency, as well as different computational and task models. Through practical projects, you'll develop your own interfaces to process signals and actuators to perform complex physical tasks in real time.

HARDWARE DESIGN OF DIGITAL SYSTEMS

Smart technology possesses increasingly complex and sophisticated hardware, making their system designs more challenging. Learn to solve these problems using state-of-the-art approaches, including hardware description languages and design abstraction levels. Using advanced electronic design automation tools, you'll regulate, simulate, debug, and implement system models to meet the speed and performance requirements of smart devices.

SOFTWARE DESIGN AND ARTIFICAL INTELLIGENCE

Put your software design skills to the test in real-world projects — gain extensive hands-on experience in object-oriented programming, data structures and algorithms, multi-threaded programming, network programming, and scripting. Develop skills in artificial intelligence and machine learning techniques applied to engineering systems and workloads. You will be introduced to essential programming languages like C++, Java and Python.