

AUT

A FUTURE IN
**COMPUTER SCIENCE &
SOFTWARE DEVELOPMENT**

WHAT IS COMPUTER SCIENCE & SOFTWARE DEVELOPMENT?

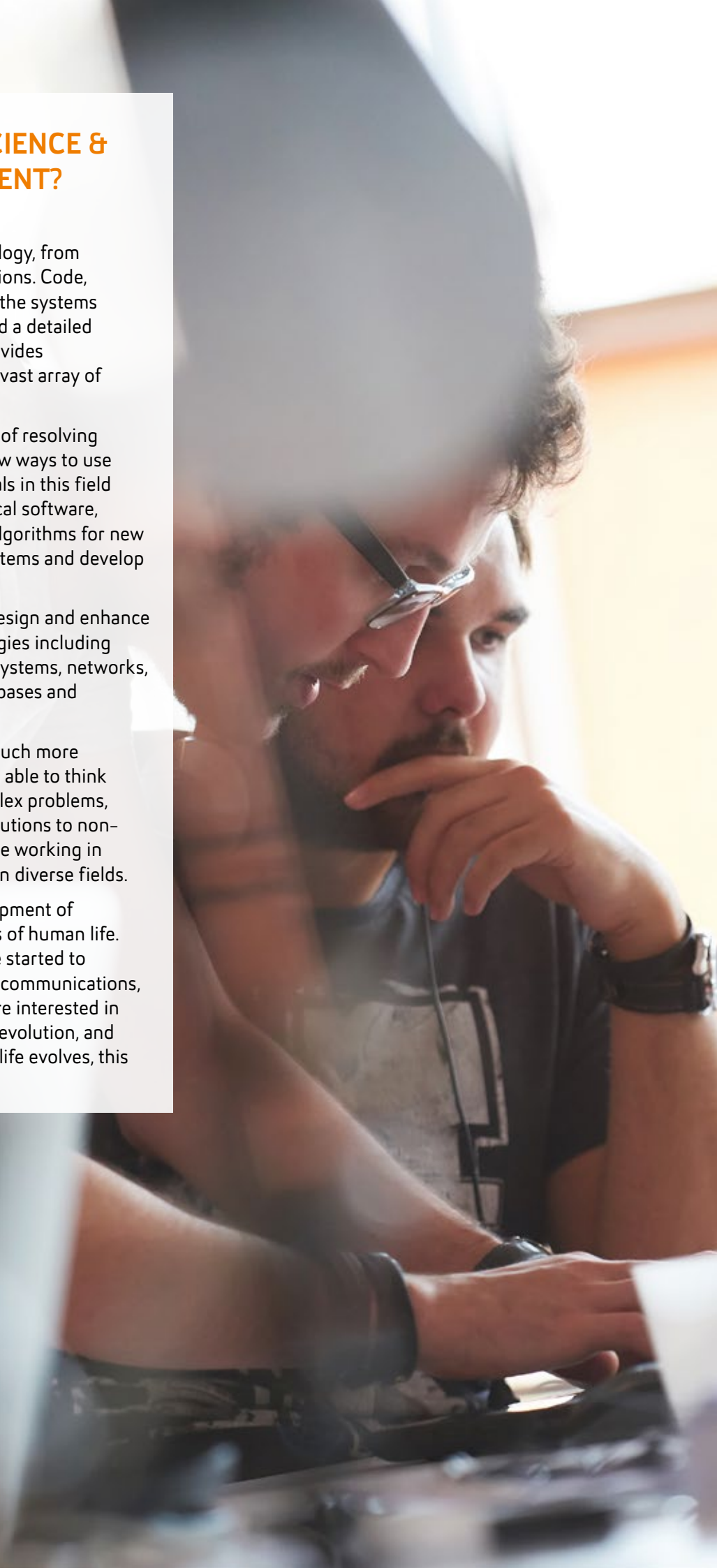
Software is the essence of all technology, from smartphones to robots to power stations. Code, algorithms and data structures drive the systems that make modern living possible, and a detailed understanding of these concepts provides considerable career opportunity in a vast array of fields.

Computer science looks at methods of resolving computing problems, and devises new ways to use computing technologies. Professionals in this field examine advanced aspects of technical software, including how to create computing algorithms for new technologies, build multi-tasking systems and develop 3D user interfaces.

Software development specialists design and enhance software and use the latest technologies including programming languages, operating systems, networks, distributed computing systems, databases and modelling.

Workers in this domain need to be much more than technical experts. They must be able to think laterally and creatively to solve complex problems, and be able to communicate their solutions to non-technical colleagues and clients, while working in interdisciplinary teams with experts in diverse fields.

There is massive potential for development of technological solutions in most areas of human life. Already, technological solutions have started to transform domains like biomedicine, communications, business and entertainment. If you are interested in being part of the ongoing technical revolution, and having an influence on how modern life evolves, this could be the career path for you.



OUTLOOK AND TRENDS

Long-term skills shortage

Software architect, programmer and business analyst all appear on Immigration New Zealand's long-term skill shortage list, which means the Government is actively encouraging skilled specialists from overseas to work in New Zealand.

Surveys of IT employers and recruiters in 2014 reported that around 75% of employers were planning to recruit additional staff due to an increase in new projects or customer demand.

Mobile/Apps

In April 2015, Google changed its algorithm to prioritise websites that provide mobile friendly access and mobility, leaving many companies scrambling to upgrade. Google also recently announced that mobile searches now surpass desktop searches in 10 countries.

Therefore a strong and accessible mobile presence is now essential for any company that has a website. The need for iOS and Android application developers has grown and will continue to do so.

Source – www.CIO.com

Embedded systems

An embedded system has a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices, from portable devices such as digital watches and MP3 players, to large installations like traffic lights and factory controllers, as well as largely complex systems like hybrid vehicles.

Big data

Many companies are collecting massive amounts of data, but most struggle to resource the organisation of data in a practical way. In 2014, the demand for big data skills increased over 120% for IT project managers and just under 90% for computer systems analysts.

Source – www.CIO.com

Cloud

The adoption of cloud storage systems, eg iCloud, OneDrive, Google Drive, and Dropbox, has prompted the need for more data analysts and security professionals.

The demand for skilled cloud computing and cloud security professionals will continue to increase as cloud storage continues going mainstream.

Source – www.CIO.com

WORK SETTINGS

Usually work regular office hours, with some evening and weekend work required to meet project deadlines.

Have their own office, but at times also work in client workplaces and often able to work from home.

They work for a wide range of organisations, including private companies that provide computer, database and network services to clients, specialist ICT companies, software companies including entertainment and gaming specialists, startups, computer consultancies and telecommunication companies.

CAREER EXAMPLES

Computer science and software roles often overlap, so these job titles could be accessible to graduates of both majors.

Business analyst

Researches the organisation's systems and procedures, deciding if and how computer applications and systems can be used to improve business efficiency and productivity.

Systems architect or designer

Analyses an organisation's software and design, oversees the development of new software systems, and ensures that these will assist the business processes of an organisation.

Programmer/software developer

Designs and maintains software systems, as well as writing software code for new applications and products.

Mobile apps designer

Develop mobile applications for a huge range of organisations using software programmes

Game developer

Creates, writes, designs, programmes, animates, and tests games and applications for computers, consoles and mobile phones.

User interface (UI) engineer

Creates intuitive and consumer-focused mobile and web applications, tasked with building a seamless experience for the end user alongside a UI designer.

SKILLS AND KNOWLEDGE

Technical skills

- Strong proficiency with principles and function of programming languages
- Skilled in designing and maintaining new web and mobile applications
- Excellent knowledge of user interface design

- Ability to analyse an organisation's overall business and establish how their software is used
- Proficient at identifying an organisation's technical requirements, and designing and building software to match
- Able to create architectural plans outlining the structure of new software applications
- Competent in testing and reviewing new software and fixing problems
- Skilled in explaining to people throughout an organisation how the software will affect their work

• **General skill requirements**

- Skilled at oral and written communication and have good presentation skills
- Able to work well under pressure, and meet deadlines
- Works well within a team, and with little supervision
- Skilled at problem-solving and decision-making

PERSONAL QUALITIES

- Quick to learn and very practical
- Interested in IT and innovation
- Logical and good at planning
- Careful and meticulous
- Technically innovative

SALARY GUIDE

	Salary (per year)
Business analyst	Junior \$60,000 - \$70,000 Senior \$85,000-\$100,000
Software developer	Junior \$50,000 - \$60,000 Senior \$80,000-\$100,000
Solutions architect applications/infrastructure	\$100,000-\$130,000 (median salary)
Game developer with 1-3 years' experience	\$40,000-\$60,000
UI/UX designer with 1-3 years' experience	\$45,000-\$80,000 UX senior designer: \$80,000-\$120,000 pa

Sources: Hudson Salary Review 2014, Robert Walters Salary Guide, Creative Store 2015 Salary Review/Potentia Salary Report 2014, Indeed.com 2015

Salary range is indicative of the New Zealand job market at the time of publication (Jan 2016) and should only be used as a guideline.

THE AUT APPROACH

All students complete a research and development project in their final year for an industry or research centre client, bringing together the knowledge and skills developed throughout the degree. Students work in teams as consultants (with AUT staff supervising), and may work on a wide range of exciting computing projects with big corporates such as Fisher & Paykel Healthcare Ltd, Deloitte and Fonterra, as well as smaller organisations like Basement Theatre, sports clubs, community, health, not-for-profit and environmental organisations.

AUT is home to several research institutes, including:

High Performance Computing Research Laboratory (HPCRL) which is the hub for high performance computing projects in New Zealand. HPCRL works across a number of research and industry projects/ initiatives aligned with computing technologies such as exascale supercomputing, big data processing and low power computing.

Software Engineering Research Laboratory (SERL) where research is conducted in key areas, namely computational methods, autonomous software, software engineering process and computer graphics, imaging and visualisation. Research within these themes has a mix of academic, practical and commercial importance that contributes to the overall knowledge economy of New Zealand.

Knowledge Engineering and Discovery Research Institute (KEDRI) where novel information processing methods, technologies and their applications are developed to enhance discoveries across different areas of science and engineering.

FURTHER STUDY OPTIONS

For those wanting more specialised study, postgraduate programmes include the Postgraduate Certificate and Postgraduate Diploma in Computer and Information Science, Master of Computer and Information Science, Master of Information Security and Digital Forensics, and Doctor of Philosophy in software development or computer science.

Recent research includes topics in agile software practices, description logic, software analytics, artificial intelligence, cloud computing, information security and computer mediated communication.



MICHELLE JAMIESON

Test Analyst, Fiserv

Bachelor of Computer and Information Systems in
Software Development

"When I was picking my Year 12 subjects at school I only had five subjects, and couldn't decide on a sixth. My dad told me to pick the hardest one available, which was programming. I really enjoyed it, and did well, so when I went to an AUT open day I asked the software lecturers about studying it at university. It sounded really interesting, so I made the leap into the BCIS.

After graduating I went into a coding job, and then I went into web testing. I now work as a test analyst for Fiserv, who develop branded mobile apps for banks all over the world.

I work as one of two QA developers in the scrum team, alongside six developers and a business analyst. We assess tasks and requirements pertaining to the development of apps. This could be anything from customer satisfaction feedback through to apps that can image cheques, which can then be deposited into a customer's account.

I really enjoy seeing the results of our work immediately, and getting positive feedback from customers and clients. I love working with mobile, which is at the cutting edge of technology, where everything is heading.

We have a great team, and Fiserv is an excellent company to work for. I'd really like to stay with them, and maybe move further into test management at a senior level."

EMPLOYER COMMENT

"Fiserv Auckland builds mobile apps for banks all over the world with a user base of a few million users. As a test analyst, Michelle is involved in identifying gaps and errors in the software being developed and ensuring that the software meets the business and technical requirements of the client. These activities in turn ensure that the users of the mobile application have a superb user experience when interacting with the mobile app performing their banking needs.

For her to do this, she requires good analytical and technical skills, attention to detail and tenacity and a good understanding of common software failures and faults. With her strong technical background and education, Michelle does a great job, and we are really happy to have her on the team."

Sumit Poddar
Test Manager, Fiserv

USEFUL WEBSITES

New Zealand Game Developers Association
www.nzgda.com

Institute of IT Professionals
www.iitp.org.nz

FURTHER INFORMATION

For the most up-to-date information on computer science and software development and the Bachelor of Computer and Information Sciences, please visit our website


www.aut.ac.nz/computer-sci

www.aut.ac.nz/software-development

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Contact the Future Student Advisory team for more information: www.aut.ac.nz/enquire

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For other Future Career Sheets visit:

www.aut.ac.nz/careersheets

For employability and career support, AUT students can book an appointment through

<https://elab.aut.ac.nz/>


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55 Wellesley Street East, Auckland Central


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The information contained in this career sheet is correct at time of printing, August 2019.

