Bridging the ICT gap

CSI Centre for Software Innovation

Enhancing innovation potential and developing smarter ICT solutions more quickly.

Introducing CSI

CSI provides a bridge between researchers in Information and Communication Technology (ICT) at The University of Auckland and the ICT industry.

The Centre engages widely with industry both through direct consultancy and contract research and via a suite of more focused programmes, such as Academy and Extenda. CSI also provides research project management support to a range of third party programmes

CSI accesses a very wide range of research capability across almost any area of ICT. Core Centre staff have world leading capability in software architecture, model driven engineering, software tools and meta tools, and domain specific visual languages. The Centre also has strong, collaborative relationships with academics and research groups in the Computer Science and Electrical and Computer Engineering departments as well as with other tertiary and research institutions globally.

Contract Research

CSI targets applied research to industry problems ranging from critiquing proposed software architecture through to extended research contracts solving significant technical problems in innovative ways. The IP from these activities typically becomes the property of the industry sponsor.

Research groups in Computer Science

Software Engineering Research Group (SERG) Software engineering and applications areas including software tools and techniques, software quality, formal methods, human computer interaction, computer graphics, scientific and medical visualisation, database systems and computer science education.

Communication and Information Technology Research (CITR) Communication theory, distributed computing and internet-based applications, information technology, language implementations and formal models, multimedia imaging (computer vision, visualisation, image or video analysis, biomedical image analysis, etc.), and robotics (active intelligent vision, embedded systems, etc.).

Intelligent Systems & Informatics Group (ISI) Develop new intelligent methods and techniques across automated planning, case base reasoning, data mining and machine learning, Informed search algorithms, intelligent information retrieval through the internet, multi-agents and softbots, AI (in health informatics, image analysis, computer games, etc.), and medical image analysis.

CS Theory Group Researches theoretical computer science, the branch of computer science that focuses on the abstract, mathematical nature of computation. The group's main interests are automata theory, computational biology, computational complexity, computability and randomness, design and analysis of algorithms, unconventional models of computation. The group is also interested in related areas, such as biology, combinatorics, logic, and theoretical physics.

Systems Development & Evaluation (SDE) Researches areas related to computer systems, computer architecture, software security, computer communications, and web engineering.

This UniServices Innovation Centre has a strong track record of working with commercial and government ICT organisations to enhance their innovation potential and develop smarter solutions more quickly. Embedded within the Computer Science and Electrical and Computer Engineering Departments, CSI has access to a very broad range of ICT expertise across the University and globally.

Research groups in Electrical and Computer Engineering

Systems and Control Group This group has close links with the schools of Biological Sciences and Medicine at the University and with other universities and industries in New Zealand. It also has extensive international links with universities and companies in the USA, UK, Germany, Australia, Japan, China, Singapore and Korea.

Embedded Systems Research Group (ESR) ESR researches high performance heterogeneous embedded systems (HES) that combine reactive (control-driven) and data-flow processing. Current focus is on semiconductor-based systems with the open doors for new emerging implementation technologies such as nano-mechanical and biological systems.

Engineering Education This group focuses on tertiary-level teaching and learning with interests including OASIS (Online Assessment System with Integrated Study), course-concept inventories and voting technology.

Power Electronics Research Group (PERG) PERG is involved with the development of inductive power transfer (IPT), motor control, electric vehicles, power electronics systems and magnetic modelling. For IPT research, the long-term goals are to make these systems cost competitive with wired systems and to extend the range of applications.

Telecommunications Research Group (TRG) TRG has two research teams – Radio Systems, and Microwave Engineering and Electromagnetics.

Robotics The group's long-term goal is to create robot assistants that will interact with and help humans. Research prototypes include a task planner, subtask learners, an instruction understander, navigation, speech recognition, mobile robot, robot arm with gripper and wrist, a mobile robot operating system, robot navigation, vision based robot localisation, vacuuming robot application, soccer robots, teleoperated robots across the network, a robot guide, and a virtual robot world for experimentation.

Signal Processing Group (SPG) SPG is interested in all aspects of signal processing, from classical one-dimensional topics such as speech processing through to two-dimensional image processing and multispectral analysis techniques. The group's research efforts are directed towards signal description and analysis, as well as hardware implementation systems such as digital signal processor (DSP) chips. Signal processing is not an end in itself; instead it provides a toolkit of techniques that can be applied across all branches of engineering. The group has three special interest teams in the areas of Speech Processing, Forensic Image Analysis and Forensic Speech Analysis.

Auckland UniServices Ltd

Auckland UniServices Limited is the largest research and development company of its kind in the Southern Hemisphere and a wholly owned company of The University of Auckland.

By connecting its clients with The University's brightest academic minds, UniServices provides commercial organisations the innovative technologies they seek, and governments the national programmes they need. The results can mean huge strides in a company's international competitive edge, or in a country's health, education and welfare capability.

UniServices manages all of The University's intellectual property and is responsible for all research-based consultancy partnerships and commercialisation.

UniServices' open innovation and world-class thinking can change the world.

Programmes

CSI runs a number of specialist programmes to help New Zealand industry innovate and grow.

Academy
Training, learning, working.

A managed Internship programme bringing together ICT students, academics and industry, offering organisations the equivalent of a term-length internship where students can be exposed to an applied culture and environment outside the classroom.

Extenda

Extenda aims to transform businesses by establishing a research-led culture. ICT companies are given the opportunity to improve their research capabilities and planning methodologies, and enhance their products, fostering innovation and productivity.

SPPi
Software Process
& Product Improvement

SPPI aims to develop and apply a range of software productivity techniques and tools to enhance the performance of the software industry in New Zealand. The focus is on process and product improvement using advanced model-based visualisation methods and tools.

HealthBots

Many repetitive and physically demanding tasks performed by healthcare workers could be reassigned to robotic assistance. Robots with superior interaction capabilities could help enrich the social experiences of patients during hospitalisation.

M-TECH

The Multimedia Imaging Technology portal, hosted at The University of Auckland, invites and supports joint activities in multimedia where images, video, graphics, panoramic images, range scans, or animations are an essential component.

Cafe
Connnecting with
Industry

Cafe provides a forum for ICT industry and academic professionals to discuss topical issues.

BeSTGRID
Broadband enabled Science and
Technology GRID

This Tertiary Education Commission Innovation and Development Fund Project focused on how to make eResearch work and how to create a fully-functional eResearch ecosystem for New Zealand.

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THE UNIVERSITY OF AUCKLAND
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