Technology Infusion

Grand Challenge

Asia 2022-23

Centre for Technology Infusion

LA TROBE
UNIVERSITY
AUSTRALIA

About the **Technology Infusion Grand Challenge**

The Technology Infusion Grand Challenge (TIGC) sets out to stimulate students to leverage new technologies and solve todays pressing problems. We are looking for students who have the insight, drive and tech ability to bring their innovations to life.

This competition is a collaboration of La Trobe's Centre for Technology Infusion, La Trobe Innovation and Entrepreneurship Program, School of Computing, Engineering and Mathematical Sciences, & the Business School who will work hand in hand to provide guidance, and – for the winning team – a two week all-expense* paid mentorship stay in Melbourne.

Since 2018, The Technology Infusion Grand Challenge has worked with over 800 undergraduate students from 200+ teams across 44 universities from India, Pakistan, Sri Lanka, Indonesia, Vietnam and China.

2022-23 Theme: Smart City Innovation

No region in the world is urbanizing faster than Asia and Asian cities have their own unique challenges, which are different from European cities.

With urban growth also come challenges of economic growth, sustainability, efficiency and liveability.

We are inviting students to use technology to help solve their own city's challenges.

The competition is open to students undertaking their undergraduate studies in an Asian country.

How does the competition work?

Students in their final two years of undergraduate studies in the field of Science, Technology, Engineering, Mathematics (STEM) and/or Business need to form teams of 3 to 5 and submit their high level concept or area of interest to their lecturer and upload it to the Technology Infusion Grand Challenge website and complete the registration form.

During the semester, students work to validate and refine their concept. Online material will be available from La Trobe Innovation and Entrepreneurship program and La Trobe Business School to help guide students.

Top selected teams will be given an investment of up to $1000 AUD to make a final prototype. This does not exclude the other teams from winning the competition in the end!

The second part of the challenge is focused on creating a working prototype, a business case with validation of the problem and refining the solution. The winner will be decided by popular vote and TIGC's panel of judges. At the end of the year, teams will present their working prototype before an international jury at a virtual showcase event.

* Expenses will include travel, accommodation and allowances for drinks and meals, according to La Trobe's Policies. Registration will open 1 October 2022. A full set of the terms and conditions of the competition will be available with the registration form. La Trobe University reserves the right to change the terms and conditions at any time in its sole discretion.

WHAT WE ARE LOOKING FOR?

Participants must:

Demonstrate strategic insight.

Solve a concrete city problem using one or more of core technologies, for example: Wireless Connectivity, Artificial Intelligence, Sensors, Data Analytics and Software.

Demonstrate the ability to build a working prototype.

WHO CAN PARTICIPATE?

Teams must consist of a maximum of 5 students and preferably with gender diversity. Students must:

Be in their final two years of studies (Science, Technology, Engineering, Mathematics and Business).

Have demonstrated technical, entrepreneurial, or leadership qualities in academic and/or extra-curricular activities.

Have approval from their Head of Department to participate in this Challenge.

PRIZE

The winning team will receive an all-expense* paid 2 week mentorship stay in Melbourne.

During their stay, the winners will have a chance to work with academic and business experts at the Centre for Technology Infusion, La Trobe Innovation and Entrepreneurship, School of Computing, Engineering and Mathematical Sciences and La Trobe Business School.

The winning team will gain valuable experience and visibility on a global stage.

latrobe.edu.au/grandchallenge

FAQs and **proceedings**

Question	Answer
How can I participate?	Follow the website to register your interest. Form a team of three to five and complete the form, obtain a letter of support from your Head of Department and upload it along with the form.
Can you give me some examples of problems you think can be addressed?	Some Smart City cases studies for inspiration: • Sustainable antibacterial and antibiofilm activity of engineered biocatalytic nanocomposites targeting biofilm cells and matrix for water treatment membranes. This innovative solution was developed by the 2020-21 TIGC winners. • A smart navigation glove for motorcyclists embedded with Bluetooth technology connected to mobile phone navigation apps helps reduce road accidents caused by the use of mobile phones by motocyclists. This innovative solution was developed by the 2019–2020 TIGC winners. • A Korean City implemented smart water meters; today they double as a social health alert: family of people who haven't used water in two days, are sent an alert. • The blood bank in Amsterdam uses smart heat exchange systems to 'store' the cold from their water system in the winter, in order to keep blood cool in summer. • Melbourne can get hot in summer and its tree health sensors measure the water needs and CO_2 conversion of the trees, helping the city council maintain the foliage that protects the city.
How can I win? What are the judgement criteria?	The final judgement criteria will be: Validity of the problem being solved (25%) • How well is the problem defined and supported? • Have the risks and opportunities of the concept been identified and assessed? Originality and impact of the solution (25%) • How unique is the solution? • Impact: Is it an incremental improvement or transformative solution? Engineering/IT excellence of the prototype (25%) • Degree of technical difficulty in building the solution • Its functional excellence for the end-user(s) Commercialisation potential of the solution (25%) • Commercialisation potential demonstrated by clarity of an exit strategy if this was a start-up initiative. Keep in mind, that at the end of the challenge, even though each criteria is weighed equally, a high score on engineering excellence is a prerequisite: a working prototype is a right of passage that cannot be compensated by the other factors.
What are the key dates and deadlines?	• **Sign up:** Registration will open on 1 October 2022 and close on 20 December 2022 • **End of Semester 1 YouTube submission:** March 2023 • **Announcement of top teams receiving funds:** April 2023 • **Submission of final project:** October 2023 • **Final event: To be announced:** November 2023

For the full terms and conditions, please see:

latrobe.edu.au/grandchallenge

Centre for Technology Infusion – La Trobe's **top tier R&D Centre**

The Centre for Technology Infusion (CTI) is an award winning R&D Centre based in the School of Computing, Engineering and Mathematical Sciences. The core of expertise of CTI is in the design and development of Sensor systems, Micro Chips, Wired/Wireless Systems, System Integration and Complex Data Analytics.

Our clients come to us to apply new technologies to solve existing problems, which usually starts with a feasibility verification and can consequently result in prototype development, field trials, market ready development and integration with legacy systems.

Blue Chip standards

CTI has established industry standard R&D infrastructure to support research and technology development in these areas, including an eco-system of the world's best delivery partners in Europe, SE Asia and India.

De-risking investment

The Centre has a strong track-record of delivering field ready solutions with our Proven Risk Elimination Methodology making us a trusted technology advisor and service provider to Industry and Government clients.

All our projects are in collaboration with industry partners and our teams are predominantly externally funded. In selected cases we even take equity in start-ups.

As an R&D Centre we know that the creation of new products is a journey which can take unexpected turns. Our experienced teams can rapidly adapt to changes and challenges in product innovation cycles – always keeping an outcome oriented mindset.

CTI Awards 2017
From left to right: Scott McKenzie (CEO, SensaData P/L), Hon Philip Dalidakis (Former Minister for Trade and Investment / Innovation and the Digital Economy / Small Business), and Professor Aniruddha Desai (CTI Director, School of Computing, Engineering and Mathematical Sciences, La Trobe University).

Autonobus
Victoria's first autonomous shuttle bus at La Trobe University.

La Trobe **Innovation and Entrepreneurship Programs**

A new approach to cultivating innovation and entrepreneurship

La Trobe Entrepreneurship and Innovation Programs (LTI&E) launched in 2017 when La Trobe University won a $1mil grant to develop a regional accelerator program (known as the La Trobe Accelerator Program).

During the next 4 years, the program assisted 57 start-ups, over 1,350 small business during COVID-19 crisis, distributed over $300k grants and hosted over 500 events. The team was successful in winning the Australian Financial Review' Community Engagement award in 2018 due to its commitment to regional engagement. In 2020, LTI&E received a mention in Scott Morison's Letter to Bendigo for their Bendigo Invention and Innovation Festival (BIIF).

La Trobe Innovation and Entrepreneurship Programs embody the strengths and cultural qualities of La Trobe University. With a strong regional presence and industry partnerships, we create a high standard suite of programs that support the development of entrepreneurship in students, staff, alumni and start-up ecosystem.

La Trobe Innovation and Entrepreneurship's mission is to develop entrepreneurship through three main objectives:

- Access to global markets through the Global Markets Accelerator Program
- Creation of a talent pool by creating opportunities for students to work in small entrepreneur teams and businesses.
- Develop and support entrepreneurs in regional Victoria

# La Trobe **School of Computing, Engineering and Mathematical Sciences**

The School of Computing, Engineering and Mathematical Sciences (SCEMS) provides an integrated network of high-level research expertise across engineering, computing sciences and the mathematical sciences.

SCEMS contains active research groups in:

- manufacturing
- civil, electronic and electrical engineering
- signal processing
- sensors
- internet of things
- artificial intelligence and image processing
- information systems
- virtual and augmented reality
- data science
- statistics
- mathematics
- physics

In addition to CTI itself, SCEMS also embeds the La Trobe Cyber Hub (cybersecurity centre) and Cisco Centre for Artificial Intelligence and the Internet of Things. The most recent Excellence in Research Assessment exercise conducted by the Australian Research Council, rated six distinct areas at or above world average: civil engineering (well above); information systems (above); artificial intelligence and image processing (above); pure mathematics (above); statistics (above); applied mathematics (world standard).
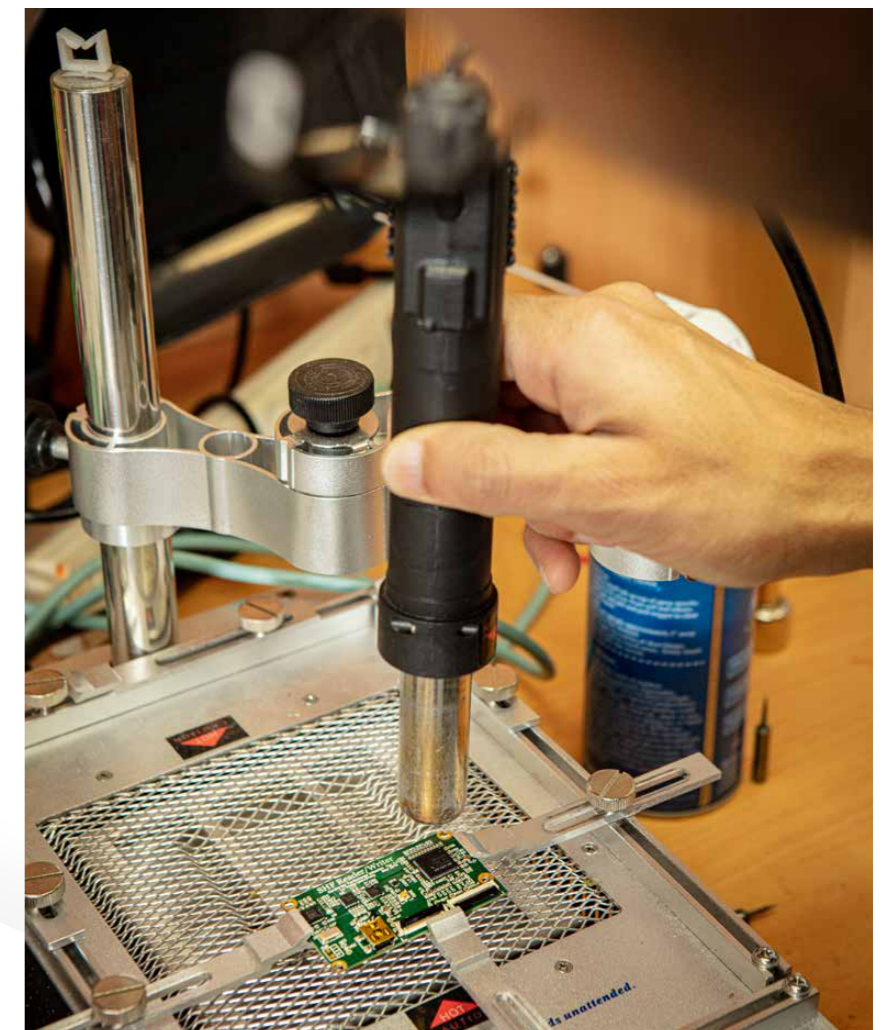
La Trobe
Business School

La Trobe Business School is an accredited member of AACSB International – the Association to Advance Collegiate Schools of Business - the highest standard of achievement for business schools worldwide.

La Trobe Business School conducts research across a wide range of disciplined areas and is recognised as a world leader by the Australian Government in its recent Excellence in Research Australia assessment. It rates "well above world standard" for Banking, Finance and Investment, while Commerce, Management, Tourism and Services, Accounting, Auditing and Accountability, Business and Management, Tourism, Economics and Applied Economics are all "at world standard" (ERA 2018-2019).

La Trobe Business School is home to a number of cross-disciplinary research centres. These centres are engaged with community, industry and international experts in business and management. The purpose of the centres is to further expert knowledge in their respective fields.

Centre for Data Analytics and Cognition is one such research centre that focuses on the theoretical advancement of AI, as well its practical contributions to organisations, the economy and society.

The Business School offers academic programs including the Bachelor of Business Analytics and the QS ranked Master of Business Analytics.

La Trobe Business School has research strengths in:

- Corporate social responsibility, governance and business ethics
- Tourism, Hospitality and Event Management
- Financial reporting and taxation
- Critical social and sustainability accounting
- Asset pricing and investment
- Financial market microstructure and information
- Financial econometrics
- Social marketing
- Branding

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LA TROBE IS THE
FIRST UNIVERSITY IN AUSTRALIA
TO RECEIVE A SIX-STAR RATING FOR SUSTAINABLE LARGE-SCALE DEVELOPMENTS.[5]

1. Times Higher Education (THE), 2020, World University Rankings 2021; Consejo Superior de Investigaciones Científicas (CSIC), 2021, Ranking Web of Universities.

2. Quality Indicators for Learning and Teaching (QILT), 2021, ComparED: Overall undergraduate results for La Trobe University.

3. Australian Research Council, 2019, Excellence in Research for Australia (ERA) Outcomes 2018.

4. THE Asia-Pacific University Rankings 2019.

5. Green Star – Communities accreditation, measured against five impact categories: governance, liveability, economic prosperity, environment and innovation.

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