

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Cleanroom Chemical Safety VR Learning Package

Members: Abdul Syafiq Bin Abdullah (Group Leader)
Cheah Wan Ting Dana

Course: *Higher Nitec* in Electronics Engineering

College: ITE College Central

Improving Cleanroom Safety Training with VR

The semiconductor industry involves working with dangerous chemicals such as hydrofluoric acid and ammonium hydroxide. To make chemical safety training safer, more engaging and time-efficient, the pair partnered with ST Microelectronics (ST) to create the Cleanroom Chemical Safety virtual reality (VR) learning package. This VR system allows trainees to learn both theory and practical skills in a safe, simulated cleanroom environment.

The learning package includes two parts. The Guided Mode walks learners through procedures step-by-step. The Assessment Mode monitors how well they perform, so trainers can identify areas for improvement. The package can be used on both blackboard systems and web platforms, supporting self-directed learning, while reducing the safety risks that come with physical sessions.

Innovators' Inspiration

“Through this project, we learned to complement and tap on each other’s strengths. Dana captured on-site videos at ST and curated the storyboard, while I created the 3D assets, leveraging my background in Games Development. This project showed us that innovation happens when people with different skills work together towards the same vision.”

- Abdul Syafiq Bin Abdullah

What’s So Special?

- Unlike traditional VR, the learning package can be deployed on web platform with internet access, making it more accessible and flexible for training.
- Learners can also use VR devices to enhance immersion, allowing them to better visualise and practise procedures in a realistic setting.
- The 3D assets are modelled after the actual ST cleanroom environment for familiarity and realism.
- Generative AI was used for text-to-speech conversion and 3D asset creation, improving workflow efficiency.
- The learning package is estimated to reduce training duration by up to 90% and is currently used by ST as part of their Chemical Safety training programme.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Sense to Score

Members: Muhammad Ariel Bin Azhar (Group Leader)
Aqil Jubair Bin Mohamed Suhaidi
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Beins Jovanna Leandra-Marie
John Emill Chiang

Course: Nitec in Mechatronics & Robotics
Nitec in Mechanical Technology

College: ITE College Central

Strength at Play

Seniors often experience a decline in motor skills, grip strength, and reaction time as they age. This can make everyday tasks, such as holding objects or gripping railings, increasingly difficult and limit their independence.

To address this issue, the team developed a hand-held device designed to help elderly users maintain and improve hand function. It features four buttons, one for each finger except the thumb. When a light illuminates beneath a button, the user must press the corresponding button as quickly as possible. Three game modes – easy, medium, and hard – control how quickly the lights illuminate, with speeds increasing to challenge users' reflexes. A strap secures the hand to the device during use, ensuring proper positioning.

By combining coordinated hand exercises with a game-like approach, the device encourages repeated practice, helping seniors to gradually improve their grip strength and reaction speed in an engaging and accessible way.

Innovators' Inspiration

"My teammate's grandparents have difficulty with their grip strength. I have also noticed that many elderly people struggle to hold onto the grab poles when getting off the bus. Seeing these challenges inspired us to develop a solution to help the elderly improve their hand strength and coordination. As we were all new to programming, it was a steep learning curve. In the end, seeing the idea come to life was rewarding. It was the most satisfying moment for us after all the effort we put into making it work. We hope our device will make daily activities easier for the elderly and enhance their quality of life."

- John Emill Chiang

What's So Special?

- The device is available in three types of button springs – soft, medium, and hard – each offering a different level of resistance to help users gradually strengthen their fingers.
- Built-in Wi-Fi and Bluetooth connectivity allow the device to connect to a cloud-based analytics platform that records and analyses users' finger response times for performance tracking.
- The device is USB-rechargeable, eliminating the need for battery replacements.
- Made from 3D-printed PLA (polylactic acid), the casing is strong, affordable, and durable.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Venusta PolAlroid

Members: Elysia Wong (Group Leader)
Yen Wei Chen Manfred
Lecarde Tan Le En
Ngo Song Jie
Muhammad Shazryan Bin Mazlan

Course: *Higher Nitec* in Business Administration
Higher Nitec in Accounting
Higher Nitec in Immersive Applications & Game

College: ITE College Central

Reimagining Instant Photography with AI

The instant camera market continues to thrive globally, but traditional instant prints generate significant environmental waste due to discarded or faded film. While hybrid instant cameras allow users to select images from digital storage before printing, they lack the ability to transform or beautify images creatively.

Recognising this gap, this interdisciplinary team from ITE College Central developed Venusta PolAlroid, a hybrid instant camera driven by Artificial Intelligence (AI) which transforms photos into creative digital artwork before printing. Users can choose from a range of artistic styles, from anime and 3D art to caricature and illustration, blending instant photography's charm with environmental sustainability.

Innovators' Inspiration

"Working on this project was both challenging and rewarding. We faced many obstacles and went through multiple rounds of trial and error. As the saying goes, 'failure is the mother of success'. This experience taught us the importance of teamwork, perseverance, and problem-solving. We supported each other and it helped us overcome difficulties and keep on improving. We also leveraged our different skillsets and learnt from one another throughout this journey. In the future, I hope to apply these skills to create meaningful and innovative solutions to make the world a better place."

- Elysia Wong

What's So Special?

- Venusta PolAlroid is the first all-in-one digital, instant and AI-powered camera in the market.
- By allowing users to preview and enhance images before printing, it helps to reduce environmental impact by minimising wasted film.
- The prototype has been successfully trialled at events targeted at children and teenagers.
- Moving forward, the team plans to enhance the camera's usability and collaborate with SMEs on further user customisation.

LEE KUAN YEW TECHNOLOGY AWARD 2026 WINNING PROJECTS

Project Title: GripAssist

Members: Miya Soh Si Wen (Group Leader)
Peng Kee Yuan Gelfrid
Adam Danyal Bin Muhammad Faizal
Seh Jia Jun

Courses: *Higher Nitec* in Mechanical Engineering
Higher Nitec in Nursing
Nitec in Mechanical Technology

College: ITE College East

A Safer Grip

As Singapore's population ages, fall-related injuries among seniors are becoming an increasingly urgent public health concern. According to the National University Health System¹, nearly 40% of falls among people aged 65 and above account for injury-related deaths. Many of these accidents occur at home during routine activities – for instance, when seniors attempt to get out of bed without assistance. Without proper support or adequate lighting, a simple movement can quickly turn into a dangerous fall.

To tackle this problem, the team developed GripAssist, a smart, ergonomic support handle designed to help elderly individuals move safely from lying down on the bed to standing. Mounted securely on hospital or eldercare bed rails, the device provides a stable grip while integrating an IoT motion sensor that automatically activates ambient lighting when the user sits up at night. Fabricated using carbon-fibre reinforced 3D printing and optimised through generative design, GripAssist is lightweight, strong and cost-effective, offering a practical solution that supports safer and more independent living.

Innovator's Inspiration

"We wanted to design something simple but meaningful that could help prevent injuries among the elderly. Through this project, we realised how technology like generative design and IoT can work together to solve everyday healthcare challenges. Our hope is that GripAssist can give seniors more confidence and independence while easing the burden on caregivers."

- Miya Soh Si Wen

What's So Special?

- The project came in second at the Asia Design-to-Make Competition 2025.
- The team leveraged Generative AI through Fusion 360's design exploration tools to overcome initial challenges, such as accommodating different bed rail sizes while keeping the prototype lightweight yet strong. These tools optimised the structure for strength while reducing material usage by about 40%.
- Its fully 3D-printable design also makes it cost-effective and easy to scale for deployment across hospitals, homes, and eldercare facilities.

¹ National University Health System. (2023, January 25). How to prevent falls among older adults. *NUHS+*. <https://nuhsplus.edu.sg/article/how-to-prevent-falls-among-older-adults>

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: iScore

Members: Ong Di Jing Roger (Group Leader)
Nur Serianni Binte Muhammad Rossuandi
Muhammad Al Aqmal Iqram Bin Abdul Kader
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Course: Nitec in Mechanical Technology
Higher Nitec in Mechanical Engineering
Higher Nitec in Electrical Engineering

College: ITE College East

Levelling the Playing Field

Individuals with cerebral palsy are often left out of simple joys like carnival games, not by choice, but by design. Many of these games rely on physical actions that can be difficult for those with limited motor control. Recognising that this creates unintended barriers to participation and social connection, this interdisciplinary team from ITE College East developed iScore – an inclusive adaptation of the classic high-score roller carnival game.

Instead of requiring players to roll a ball manually, iScore utilises a motor-assisted system with intuitive push-button controls that allow players to position the ball and launch it via an auto-release mechanism. By reducing the physical effort required, iScore enables individuals with mobility limitations to play independently and experience the thrill and excitement of a carnival game.

Innovators' Inspiration

“Our team felt that most carnival games were not designed with motor-impaired users in mind, limiting opportunities for shared experiences. iScore was created to change that. Sustainably built and motor-assisted, it enables individuals with cerebral palsy Levels III and IV to participate more independently in a carnival setting. By reimagining a classic game through an inclusive lens, iScore is safe, scalable, and most importantly, opens up opportunities for meaningful play and connection.”

- Ong Di Jing Roger

What's So Special?

- A DC motor and linear rail mechanism provide smooth, reliable ball guidance for accurate gameplay.
- Large push buttons are positioned at a wheelchair-friendly height, allowing players with limited hand mobility to navigate and control the ball via simple left-right inputs.
- An automatic solenoid release launches the ball after 40 seconds to maintain game flow, with a manual override for players who need more time to guide the ball into position.
- Built with a durable plywood structure and modular components, the device is portable and suitable for repeated community use.
- iScore clinched first place at the Singtel x LionsForge Inclusive Hackathon 2025 and was later showcased at the Singtel Carnival 2025, where it was well received by participants.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Kombucha SCOBY

Members: Joshua Yeo Zhi Heng (Group Leader)
Cyndi Tay Xin Lin
Choo Jean Yan Jeneil

Course: *Higher Nitec* in Bio-Chemical Technology

College: ITE College East

Turning Tea Waste into Leather

Conventional leather and synthetic alternatives come with serious environmental costs, from toxic chemical pollution to microplastic waste, creating an urgent need for more sustainable material solutions.

To address this, the team explored the potential of **Kombucha SCOBY (Symbiotic Culture of Bacteria and Yeast)** – a by-product of fermented tea – as a sustainable, bio-based alternative to leather. The bacterial cellulose produced during the tea fermentation process can be harvested, dried and processed into a sustainable leather-like material. By enhancing the material with natural oils for flexibility and using food-grade dyes for colour, it becomes suitable for making items such as accessories and upholstery.

The team also experimented with using discarded coffee grounds and sugar cane pulps as alternative substrates, demonstrating how food waste can be transformed into valuable materials while supporting circular economy practices.

Innovator's Inspiration

"Working on this project changed the way we see everyday materials. We realised that something usually thrown away, like excess SCOBY from kombucha fermentation, could be transformed into a useful and sustainable product. It taught us that innovation does not always mean creating something entirely new, but also in seeing new possibilities in what already exists and using science to give it a second life."

- Joshua Yeo Zhi Heng

What's So Special?

- The production process is environmentally friendly and does not involve harmful tanning chemicals typically used in leather manufacturing.
- Tests with mealworms suggest that the material can break down naturally, reducing long-term environmental impact and encouraging composting.
- The material is highly versatile, with its thickness, colour, and texture customisable during production, allowing it to be used in applications such as fashion accessories, upholstery, and packaging. Its high strength also makes it a sustainable alternative to plastic bags.
- The team developed a functional prototype in the form of a purse, lined with fabric for added durability and structure, which remained flexible and intact after four months.

LEE KUAN YEW TECHNOLOGY AWARD 2026 WINNING PROJECTS

Project Title: Ragblox

Members: Seah Wen Hui Jofina (Group Leader)
Glenda Tan Yi Ling
Limoran Alianna Cabucos
Ong Jing Xuan
Chua Jing Xuan

Course: *Higher Nitec* in Mechanical Engineering
Higher Nitec in Bio-Chemical Technology

College: ITE College East

Fashion's Second Life

Driven by the rise of fast fashion, textile waste has become a growing issue in Singapore. Many people discard clothes that are still in good condition before they are worn out. Most of such waste ends up in landfills or is incinerated.

Ragblox tackles this problem by transforming unwanted clothing into sustainable coasters using an innovative chemical process. The team starts by cutting waste fabric into small pieces and placing them into a mould, before mixing them with a natural binder called sodium alginate. When treated with calcium chloride, the mixture hardens, binding the fabric together to form a solid base for the coasters.

The team conducted several tests to find the right mixture for achieving the coasters' desired hardness and durability. They also experimented with different types of fabric and discovered that 100% cotton binds most effectively. Through repeated testing, they eventually developed a combination that produced a strong and reliable material for the coasters.

Innovators' Inspiration

"One of my teammates had a lot of clothes she no longer wanted, which got us thinking about how we could repurpose instead of discarding them. Along the way, we learned that Singapore generates a huge amount of textile waste, with only a small portion of it recycled. This inspired us to create a sustainable and practical using waste fabric. It was rewarding to see our idea successfully transformed into a useful product. Through our creation, I hope we can encourage more people to rethink and repurpose waste materials."

- Seah Wen Hui Jofina

What's So Special?

- Each coaster has a distinct appearance, as the colours and patterns vary depending on the mix of waste fabric used.
- Unlike conventional fabric-based coasters that are stitched or glued, Ragblox products are produced entirely through a chemical process.
- The coasters are treated with an environmentally friendly waterproof spray to enhance durability and water resistance.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: AI Beverage

Members: Azrullah Bin Jamilludin (Group Leader)
Gabriel Tang Zhuo Xian
Choy Jun Hao Febian
Vanessa Lim Juin Wei
Donn Chan
Karin Teo Ming Yi

Course: *Higher Nitec* in Electronics Engineering
Nitec in Hospitality Operations
Higher Nitec in Hospitality Operations

College: ITE College West

Cheers to AI

Many of us would like to make healthier choices but taste is also important. That is why this team of six interdisciplinary students from ITE College West came up with an app to encourage healthier drink creation without compromising on flavours.

By integrating AI technology, the app allows the user to key in available ingredients, indicate flavour preferences (sweet, refreshing, fruity, etc), and specify sugar level based on the Health Promotion Board Nutri-Grade system, as well as their tolerance for sourness. It then generates a recipe along with a visual guide, helping users create healthier drinks tailored to their preferences. An inbuilt assistant also answers questions about the recipe, provides suggestions for possible substitutions and mixing techniques, offering further customisation.

Innovators' Inspiration

"We noticed that people are drinking a lot of sweet drinks. We wanted to use technology to help create something to encourage people to make healthier choices. It also has to be easily available for public use and suggest recipes that taste good. That led us to come up with this app to help people create delicious drinks using ingredients they already have and tailored to individual preferences."

- Azrullah Bin Jamilludin

What's So Special?

- The team used a no-code app builder and AI technology to simplify the creation process.
- As ChatGPT might suggest impractical recipes, the team refined prompts for the app so it sources recipes only from reliable online databases, resulting in drinks that are palatable and easily to prepare. They also taste-tested app-generated recipes to sift out those that do not taste good.
- In addition, the team collaborated with a hotel from an international chain to pilot the app. Guests could input their preferences, upon which the app would generate one of four customised mocktails that best suited their tastes, which they could then present at the bar to redeem their complimentary drink.
- Looking ahead, the app can be further refined and customised to meet the needs of different clients.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Safe Care Guardian

Members: Nur Syanaz Elizda Binte Yasser Araffat (Group Leader)
Tay Yuan Yin
Kang Ming Xuan
Koh Hui Jing

Course: Higher Nitec in Security System Integration

College: ITE College West

A Silent Watch, A Lifeline Home

There is an increasing number of elderly individuals living alone in Singapore, exacerbated by declining birth rates and smaller family units. As a result, many seniors lack close family support for daily assistance. This trend raises significant concerns, as sudden emergencies may go unnoticed, potentially leading to tragic situations where individuals are discovered only much later.

The SafeCare Guardian System offers a solution to the critical issue of solitary deaths by providing a non-intrusive, passive monitoring system that detects prolonged inactivity. Utilising a combination of Passive InfraRed (PIR) and Microwave Human Radar sensors, the system can accurately identify extended periods of inactivity. When such instances are detected, the system automatically sends timely alerts to designated family members, relatives, caretakers, or volunteers via channels, such as email and Telegram, enabling timely intervention.

Innovators' Inspiration

"During a visit to an Active Ageing Centre, we observed that many elderly individuals were living alone, which raised concerns about their wellbeing. Reading about seniors dying alone highlighted the possibility of help not arriving in time. We wanted to create something that could discreetly monitor them, so their families would not have to constantly worry and would be alerted if something was wrong. Ultimately, it is about ensuring their safety and giving their loved ones a peace of mind."

- Nur Syanaz Elizda Binte Yasser Araffat

What's So Special?

- The system monitors activity without requiring any interaction from the user, respecting their independence and privacy.
- It is designed to be affordable, with low hardware costs and minimal recurring fees, making it accessible to a wide range of users and their families.
- Its two-factor motion detection with both PIR and Microwave Human Radar sensors significantly enhances accuracy and minimises false alerts, while multiple-channels alerts via email and Telegram, ensure that caregivers and loved ones are promptly informed.
- The system is also highly user-friendly and scalable as its core technology can be adapted in various applications, such as remote security monitoring and smart home energy management.

**LEE KUAN YEW TECHNOLOGY AWARD 2026
WINNING PROJECTS**

Project Title: Smart Pill Dispenser

Members: Nur Shafiqah Binte Muhammad Hafidz (Group Leader)
Mirra Syamilah Binte Jumani
Rebecca Wan Yan Yee (Wen Xinyi)
Natasha Alya

Course: *Higher Nitec* in Mechanical Engineering

College: ITE College West

Pillar of Health

Administering medication at home can be a daunting task for elderly patients and their caregivers. Patients may struggle to keep track of timings, while caregivers face the constant risk of misinterpreting dosages. Managing multiple prescriptions may also increase the likelihood of confusing different pills. These common human errors are stressful and can interfere with a patient's recovery and treatment.

To address these challenges, the team developed a medication management system that integrates a web application with an automated pill dispenser. Through the web application, a patient or caregiver can enter a username and set the names and dosages for up to three different types of medication. This input prompts the dispenser's hardware to release the correct pills according to the scheduled timings, ensuring the treatment plan is followed through.

By removing the manual burden of scheduling and dispensing medication, the system reduces the risk of error and provides peace of mind to families and caregivers. This project won the 'Most Innovative Award' at the Asia Design-to-Make Skills Competition 2025, a regional challenge for vocational institutions to create inclusive design solutions.

Innovators' Inspiration

"When our lecturer shared how tough it was to manage his parents' medication, my team wanted to do more than just offer him a basic pill box. We had no experience in coding or product design but knew there had to be a way to automate the process. At first, our code failed and the motor wires kept getting in the way of the dispensed pills. It was a mess but we kept on refining and improving our design. This experience really opened my eyes to the power of solving real-world problems. Everyone in my team chipped in so we could build something that can help others."

- Nur Shafiqah Binte Muhammad Hafidz

What's So Special?

- The web application enables personalised scheduling where users can customise the system to specific medication needs.
- The dispenser can store up to a month's supply of pills, reducing the need for frequent refilling of medication.
- The device was produced using eco-friendly Polylactic Acid filament through 3D printing, keeping costs low while supporting sustainability.
- An LED light strip at the dispenser's base enhances visibility in low-light conditions while adding a sleek, modern aesthetic.
- The system also has potential to be developed into a mobile application with push notifications and sound alarms to remind users to take their medication, and future enhancements could incorporate AI features, with sensors or cameras to verify the identity of the individual collecting the dispensed medication.