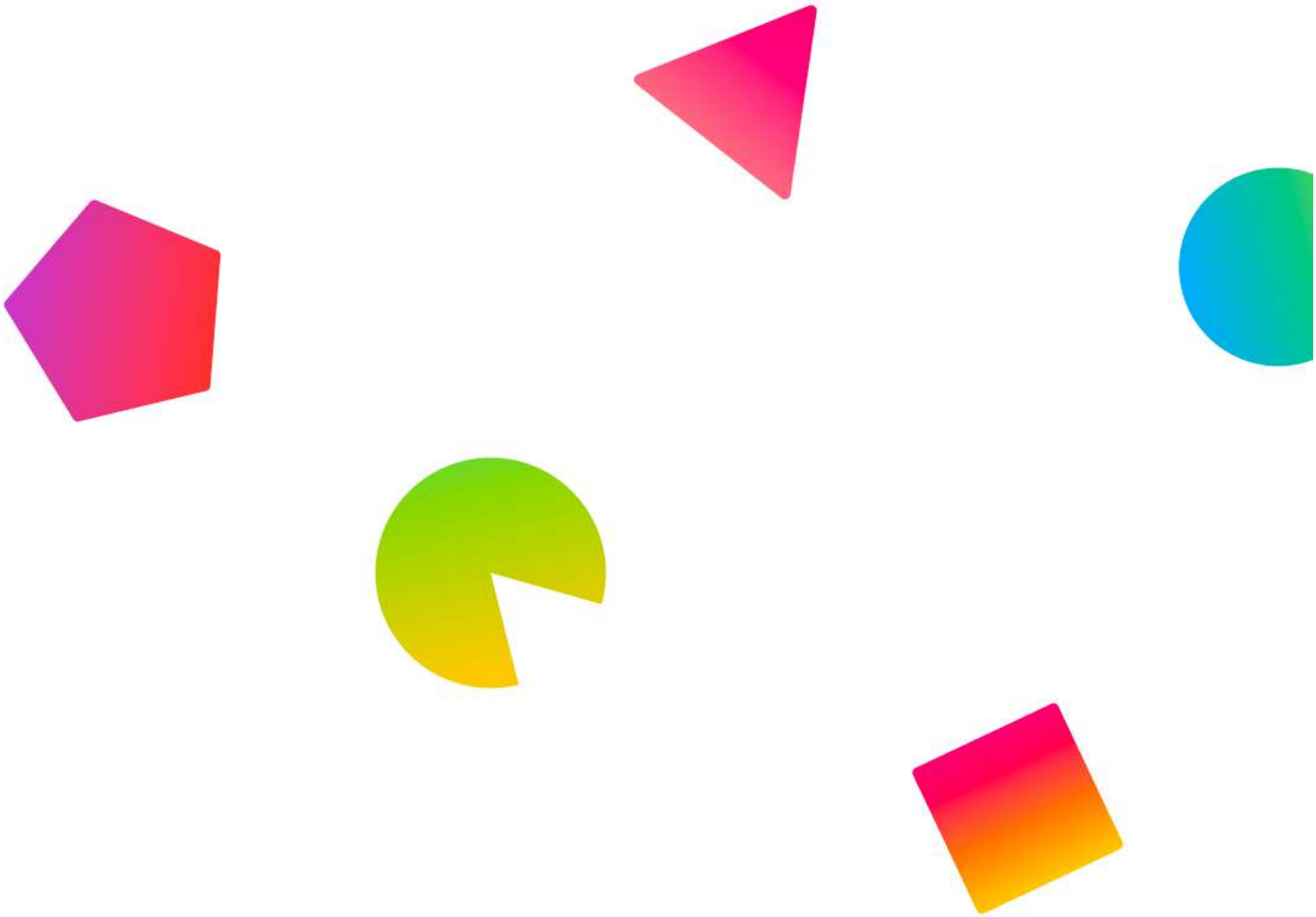
STEAM UNITY

Design for Community



Opportunities in the community

Sustainability

Alternatives to Plastic Bags

Hao Ren Hao Shi Ltd.
Mobile Charity: Blk 492E/492F Tampines Avenue 5
Alternative Site: Block 159, Lorong 1, Toa Payoh, SG 310159

好人好事 Hao Ren Hao Shi

Context

Whether from the supermarket or at volunteer drives, there is a heavy reliance on plastic bags to hold grocery items. Although alternatives like paper and recyclable bags exist, plastic bags are highly preferred due to their low cost, water resistance, strength, and convenience. Many users also reuse them as trash bags for their own homes. The one-time use of such plastics however is not environmentally sustainable.

Opportunity

How might we create solutions for grocery shoppers that reduce or eliminate the use of plastic bags so they can still transport goods in a convenient, environmentally friendly, and cost-effective manner?

From Manure to Fertiliser

Gallop Stable
61 Pasir Ris Green

Context
Horse manure is an excellent natural fertiliser because it is packed with nutrients like nitrates, which plants need to grow well. Unlike artificial fertilisers, they do not contain any harmful chemicals, making them a safe and eco-friendly choice for improving soil quality and helping plants thrive. This is because horses are picky eaters—they only eat the best grass and drink clean water, making their manure nutrient-rich. Even though it works so well, we are not using horse manure as much as we could. Right now, only a small part—about 20%—of it is being harnessed as fertilisers. This means there is a lot of potential to use them more widely, beyond just on horse farms.

Opportunity
How might we innovate the processing and distribution of horse manure as fertilisers to maximise its effectiveness for soil enrichment and plant health, while overcoming challenges related to scalability, odour, and ease of use, for widespread adoption in landscaping beyond the farm?

Empowerment Through Sustainable Farm-to-table

Metta Welfare Association
32 Simei Street 1

慧光福利协会
METTA WELFARE ASSOCIATION

Context

Metta Care was established in 2014 to provide F&B vocational training for Metta School graduates with mild intellectual disabilities and/or autism. Metta Care's mission is to provide an avenue for these youths to acquire vocational work and life skills through comprehensive training and development programmes and create employment opportunities to help them achieve economic independence and self-reliance.

Metta Café serves healthy and delicious vegetarian meals prepared by chefs and apprentices (some of whom are Metta School graduates) and is open to the public. To diversify the café's vegetables supply and empower apprentices to learn to grow and harvest their own vegetables, Metta Café set up a rooftop garden earlier this year. However, due to environmental factors such as heat and insufficient knowledge about gardening, they were not able to grow many vegetables from their soil-based garden.

Opportunity

How might we equip apprentices at Metta Café with the knowledge and tools necessary to successfully grow and harvest their own vegetables with a sustainable process?

Sustainable Solutions for Responsible Waste Disposal

Housing & Development Board (HDB)

HOUSING & DEVELOPMENT BOARD

Context

Public housing equipped with Pneumatic Waste Conveyance Systems (PWCS) offers numerous benefits, such as improved hygiene, reduced pest infestations, and minimised noise and odours. However, improper waste disposal—such as the disposal of irregularly shaped or non-compliant items—can cause blockages, disrupting the system.

When blockages occur, waste accumulates, leading to operational downtime, increased maintenance costs, foul odours, and pest infestations. Residents may face inconvenience from overflowing chutes, and system reliability could be compromised.

Current measures, such as hoppers with back-flip mechanisms (large image above) and volume-controlled hoppers (image in the circle above), have been implemented to reduce the frequency of blockages. While largely effective, improper waste disposal practices by residents continue to pose challenges.

Students are invited to approach this issue comprehensively, considering factors such as user behaviour, system design, and community engagement to develop innovative and sustainable solutions that further minimize the risk of chokage.

Opportunity

HMW encourage residents to dispose of waste responsibly in blocks with PWCS by leveraging thoughtful design to reduce the risk of chute blockages while promoting proper waste disposal practices?

Collection of Rainwater for Reuse at every Factory unit

JTC

Context

Factory operations consume large amounts of water daily, from cooling systems and cleaning to manufacturing processes. However, during Singapore's frequent rains, a significant amount of water simply flows off rooftops and open areas, going unused. This wasted rainwater represents a missed opportunity to reduce reliance on treated water and to promote sustainable practices within the industrial sector.

While some factories have basic rainwater collection systems, they are often inefficient or not tailored to the specific needs of individual units. Factory operators may also face challenges such as limited space, insufficient resources for system installation, or uncertainty about how to use collected rainwater effectively.

Students are invited to reimagine rainwater as a valuable resource for individual factory units. By designing systems that are efficient, scalable, and easy to maintain, students can empower factories to collect and reuse rainwater for their operations. These solutions can help lower water costs, reduce environmental impact, and showcase sustainability in industrial practices.

Opportunity

HMW How might we enable individual factory units to collect and reuse rainwater effectively, transforming rain into a valuable, sustainable resource on-site?

Safety & Accessibility

Bicycle-sharing Parking Hazard (3)

Anywheel Pte. Ltd.
Tampines East MRT station

anywheel

Context

LTA has assigned designated yellow box parking spaces and bicycle racks for bicycle-sharing riders. However, when returning their bicycles, riders either park their bicycles illegally or park them haphazardly around the yellow box. This impedes accessibility of walkways, compromising the safety of pedestrians, children, wheelchair users and persons with disabilities, alike.

Similarly, some riders also bring these bicycles up to their apartments for their frequent use. They are parked illegally along corridors and even fire-escape staircases. This compromises safety and limits the number of bikes available to the public.

Opportunity

How might we design a solution for Anywheel cyclists to ensure that they return their rented bicycles to designated parking spots so that it will uphold the safety and accessibility of all pedestrians and public members?

Giving Up Seats on Buses and Trains to Commuters in Need

Land Transport Authority (LTA)
Singapore

Land Transport Authority
We Keep Your World Moving

Context

The Land Transport Authority launched the “May I have a seat please” Card and Lanyard in 2021, as a simple and discreet way for commuters who need a seat to alert seated passengers. However, in practice, many seated commuters are often engrossed in their phones and miss the request entirely.

To address the issue, there is growing interest in technological solutions that can enhance awareness and encourage responsiveness amongst seated commuters.

Opportunity

How might we design an effective technological solution that enhances seated commuters' awareness and encourages them to offer their seats to those in need, such as individuals with invisible medical conditions or seniors?

Statement 8: Safety & Accessibility

Enhancing Safety at Zebra Crossings

SUTD, Office of Campus Infrastructure and Facilities (OCIF)
8 Somapah Rd

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

Context

There has been a concerning increase in incidents where vehicles fail to stop at zebra crossings, resulting in near misses or accidents involving pedestrians. One contributing factor to these incidents is often driver distraction or a lack of awareness regarding pedestrians crossing the zebra crossing. This poses a significant risk to pedestrian safety, as drivers may not realise the presence of pedestrians until it's too late to avoid a collision. While zebra crossings are meant to provide a safe passage for pedestrians, the lack of adherence by some drivers undermines this purpose, leading to potentially life-threatening situations.

Opportunity

How might we enhance the safety of zebra crossings for both pedestrians and drivers to reduce the risk of accidents?

Pedestrian Safety for Visually Impaired

Singapore Association of the Visually Handicapped (SAVH)
47 Toa Payoh Rise, Singapore 298104

Context

Navigational ground tactile surfaces serve as crucial aids for visually impaired individuals, facilitating safe traversal of sidewalks by alerting them to potential hazards. However, while indispensable for the blind, these tactile markers can inadvertently create challenges for wheelchair users and pedestrians, particularly in rainy weather conditions when these tactile surfaces become slippery and pose tripping hazards.

There is a pressing need to devise an innovative solution that ensures the safety of visually impaired commuters while mitigating obstacles and hazards for wheelchair users and pedestrians, especially during inclement weather.

Opportunity

How might we design an effective pedestrian signalling system that balances the needs of both visually impaired individuals and wheelchair users, enhancing accessibility and safety for all?

User Safety for Online Platform

Cyber Youth Singapore

Context

In today's digital age, technology is deeply ingrained in the lives of many, particularly among the younger generation who rely heavily on various online platforms for communication, entertainment, and information. However, alongside the benefits of technology come significant concerns regarding user safety, including cyberbullying, scams, addiction, and other online hazards. Despite the increasing complexity of online platforms, the issue of user safety, especially in the context of cyberbullying, persists as a pressing concern. The challenge lies not only in implementing protective measures against cyberbullying and enhancing support for its victims but also in improving the overall user experience to mitigate issues like doom scrolling and addiction.

Opportunity

How might we address online safety concerns to foster a safer and more supportive digital environment for users?

Elderly Care

Visitor Awareness for Elderly with Hearing Impairments

Chinatown Active Ageing Centre
8 Jalan Kukoh

CHINATOWN Active Ageing Centre 牛车水活跃乐龄中心

Context

Elderly individuals who are hard of hearing face a significant challenge in being unaware if someone is knocking at their door. This lack of auditory awareness can lead to missed visitors or important deliveries, causing frustration, and potentially compromising their safety (e.g. during fire evacuation) and well-being.

Opportunity

How might we create a comprehensive and cost-effective solution that alerts hard-of-hearing elderly to visitors at their door and during emergencies?

Enhancing Air Quality in Senior Apartments

Sacred Grace Social Services
117 Bukit Merah View

Context

For many seniors living in apartments, there is a strong reluctance to open windows and ventilate the space due to fear of rainwater entering their homes. This reluctance seems to stem from concerns about rheumatism and 'wind'. As a result, the air becomes stale, and odours start to develop.

This issue extends beyond mere odours. It delves into broader considerations such as air quality, ventilation, and mindset. The challenge lies in designing a solution that effectively addresses these concerns, allowing for proper ventilation without the fear of rainwater entering the house. The aim is to enhance seniors' living environments, promoting their comfort and well-being.

Opportunity

How might we develop a holistic solution that addresses the reluctance of seniors to ventilate their homes due to current fears and habits, while also considering broader factors such as air quality, ventilation, and mindset?

Let’s Design for Community!