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# The IET Hong Kong

## Using Metaverse Technologies as a Tool to teach STEAM?

Geddy TW LEE

The IET Hong Kong Vice Chairman

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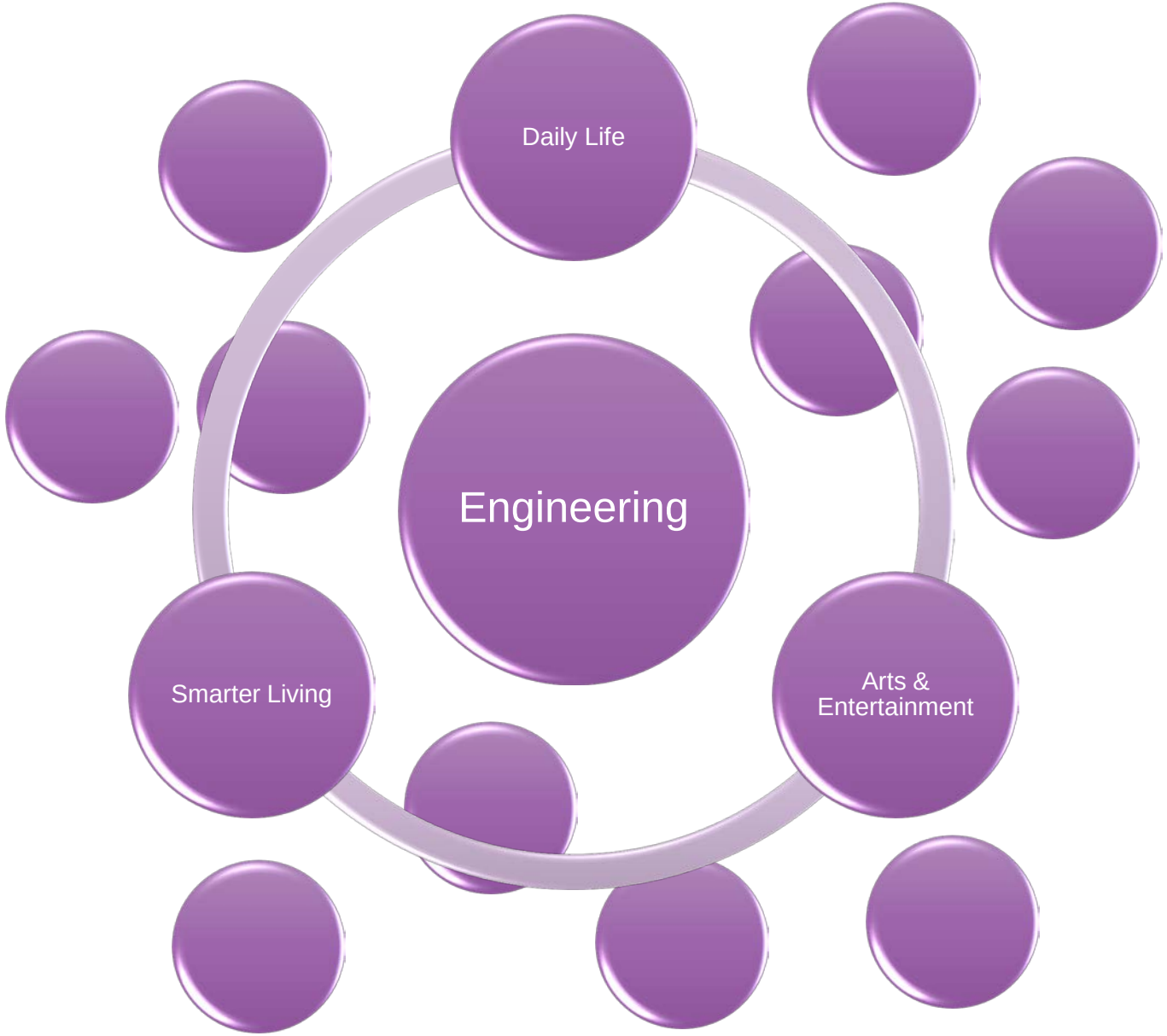
# 「工程伴理行」活動領域:

「生活中的工程」

「**藝術及娛樂工程**」

「智慧生活」



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# Geddy TW Lee

BA(ID) MSc(Eng) MSc(IT) MSc(Multimedia)

- The IET Hong Kong – Vice Chairman
- The IET Hong Kong – Faraday Challenge Leader
- Acting Head – IT Department, HKIVE (Sha Tin)
- Centre Manager – Metaverse Innovation Centre, HKIVE (Sha Tin)

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## So what is Metaverse?

- Meta – Greek Word (After/Beyond)
- Verse – Universe
- A network of 3D virtual worlds with focuses on social connection
- Facilitated by the use of VR/AR/XR.... Headsets
- ……
- It doesn’t has to be related to buying virtual land , NFTs

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# Companies working on Metaverse

- Meta
- NIVIDIA
- Epic Games
- Unity
- Microsoft
- Apple
- Decentraland
- Sandbox
- Roblox

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## What are we trying to do using VR/AR in Learning?

- Introduce 3D virtual worlds to newbies
- Through building the virtual worlds many STEAM concepts will come in place i.e. rigid body, elasticity, gravity, material and lighting ....etc.
- With the right context, both boys and girls can be enthusiastic in building their virtual worlds
- Learners can visualize the results and changes fairly quickly
- While Metaverse  is still evolving, the demand and know-how of 3D content creation will stay
- As long as you got a computer, most tools are free!

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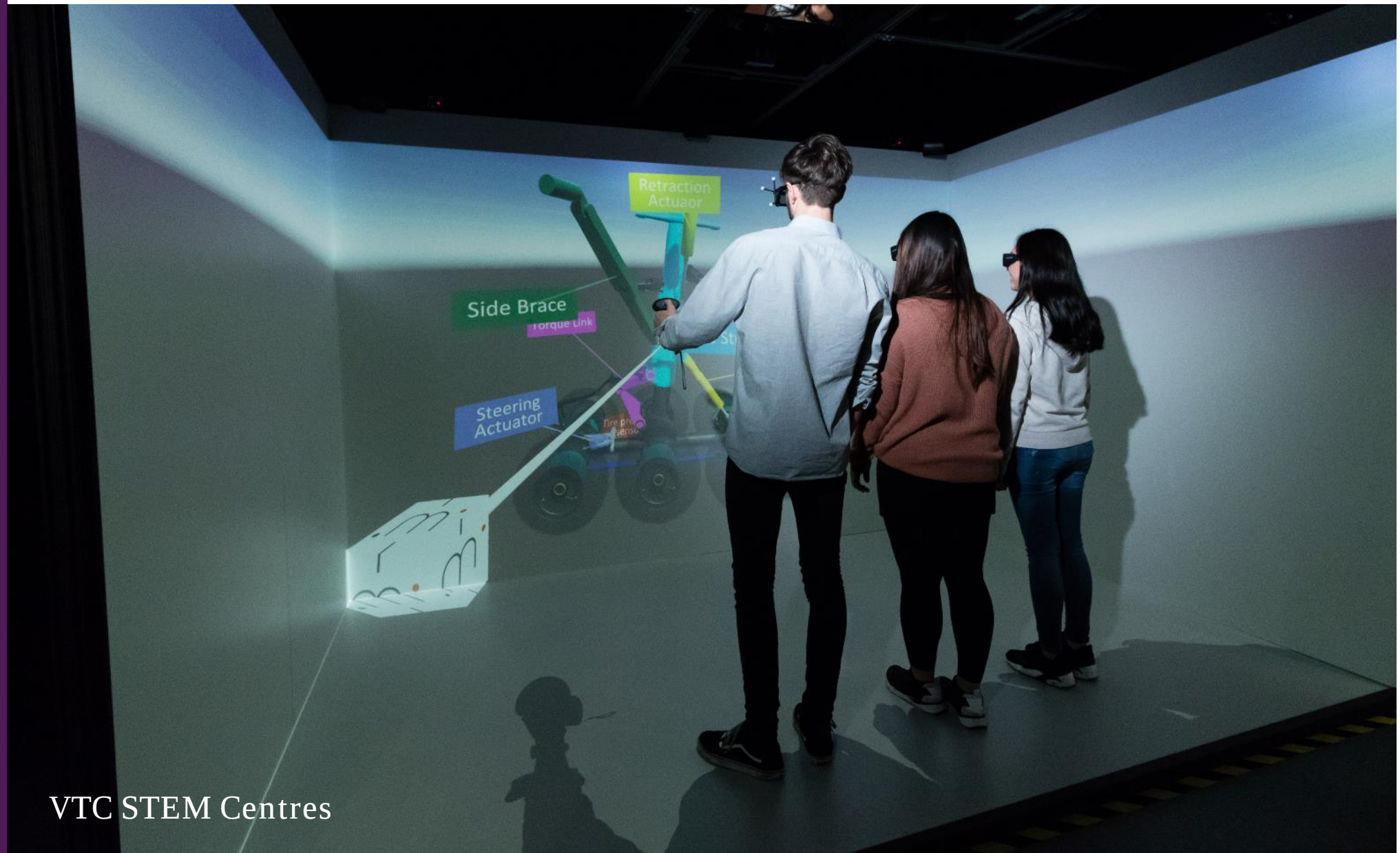


VTC STEM Centres

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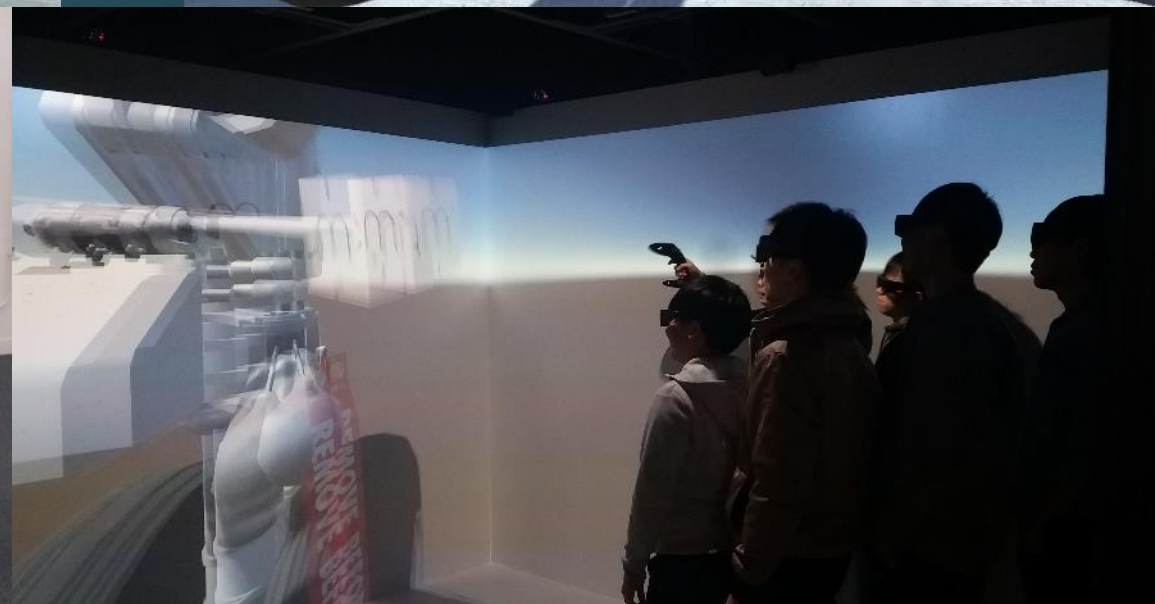

Project Manger: Ir Tim Lee / VTC

- Authentically simulates the mechanical movement and physical behaviors
- Internalize many engineering concepts through the project

Comparison of cargo loading operation in our VR training solution (left) and the real operation (Right)

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Lam Tsuen Wishing Trees Experience - Metaverse Innovation Centre

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[Bruce Lee's Former Residence - Metaverse Innovation Centre]

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- Metaverse Jumbo Kingdom Project – Student Attachment

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- Jumbo Kingdom Project – personal project by Ka-Heng, SHIU

https://thelostmetropolis.org/

# Metaverse for STEAM Education

Presented by Eugene Mak
(Founder of Scan the World Limited)

# Background

Eugene Mak Kwun Yiu

- Mechanical Engineering degree from Canada
- Worked for the Aerospace industry in R&D and manufacturing design
- Currently a commercial pilot based in Hong Kong operating the passenger Boeing 777
- Founded Scan the World Limited in 2020

# BAZAA a mobile application by Scan the World Limited

- A metaverse that is built with photorealistic textures
- The virtual world is populated with 3D scanned models
- Real products are purchasable via the app and shipped to users
- Digital preservation by 3D scanning

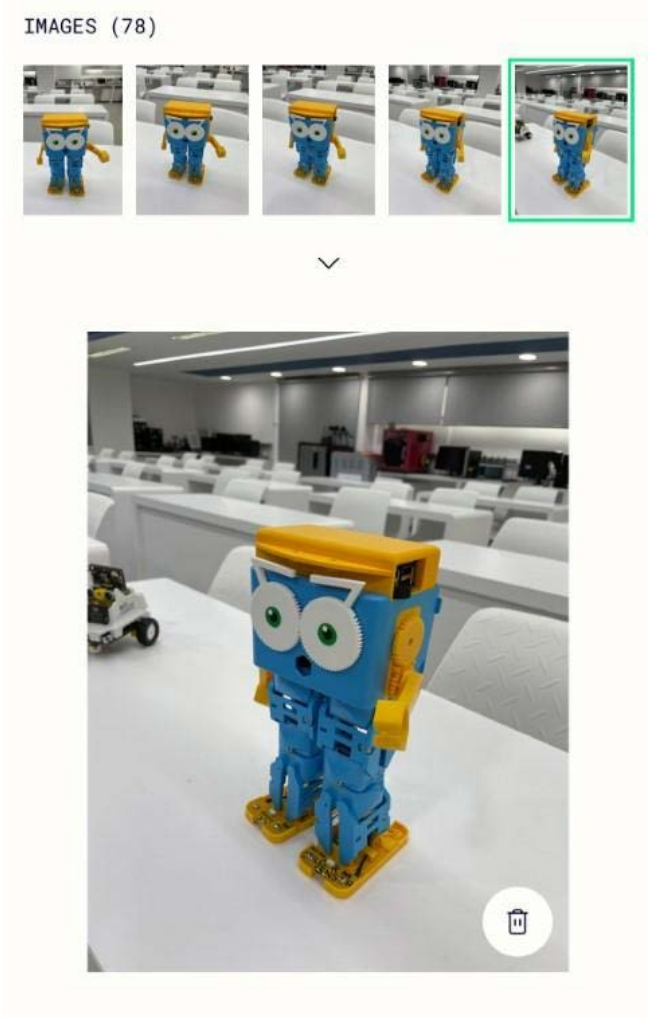
JUMBO
珍寶

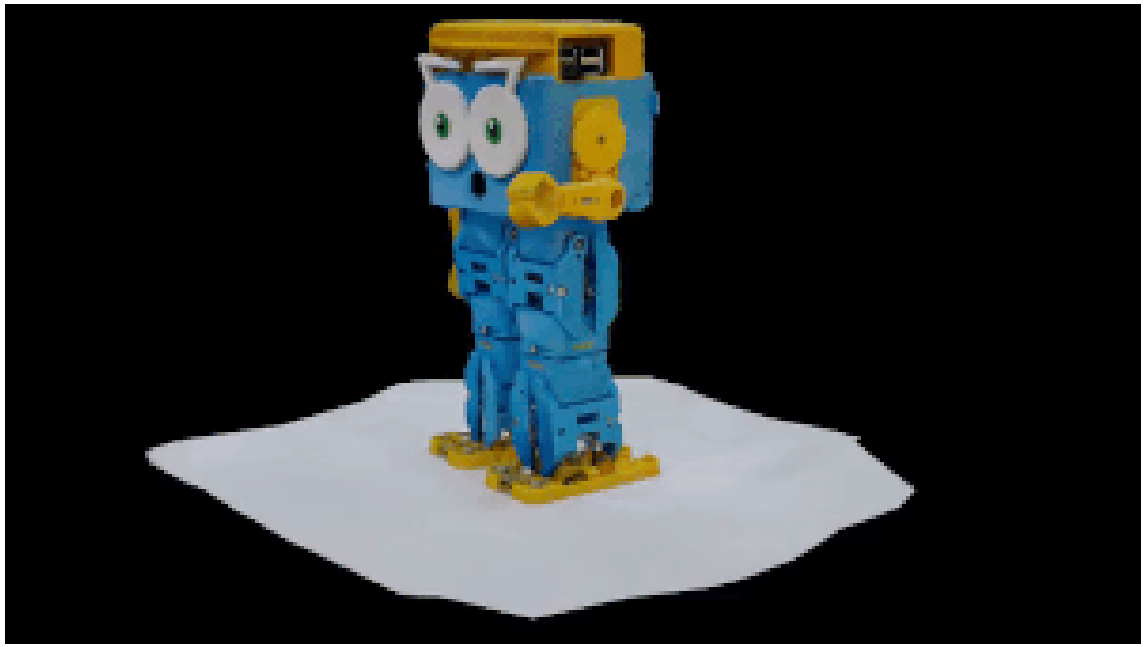
Nike Mamba Rage
Product Description
Nike Mamba Rage Basketball Shoe honors Kobe with emotion and innovation. Flyweave upper construction provides targeted comfort and support, while its drop-in Lunarlon foam midsole and micro-tread traction deliver
$1900

# Metaverse for STEAM Education

- Through creating photorealistic digital twins of schools, students build up their skills  for implementing further virtual projects
- Using 3D scanning to import models into the metaverse also promptly engage students in participating in the building of their virtual environment
- Allow spatial awareness development via 3D modelling (enhancing the ability to visualize components in assemblies)
- Skill sets can be applied beyond the metaverse (engineering/architecture/product presentation/animation/etc.)
- Learn programming logic by building functions within the virtual school (interactive algorithms, mini-games, simulations, physics, lighting, etc.)
- Knowledge exchange through hosting intra/inter school competitions/showcasing within the virtual schools

# Metaverse for STEAM Education - Sample 3D Scan



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# 藝術科技元素 – 藝術中的工程

## 科技 Technology

Audio, Lighting, Programming,
Mechanical, Interactive Props,
Projection,
Scientific Experiment,
Digital Arts…

## 藝術 Arts

Drama, Music, Dance, Set &
Costume, Props, Textile,
Make-up, Scriptwriter…

# 活動預告

- 參觀 香港演藝學院/劇場
- 藝術科技Arts+Tech 演出欣賞
- 工作坊
- 藝術科技、劇場設計、安全講座

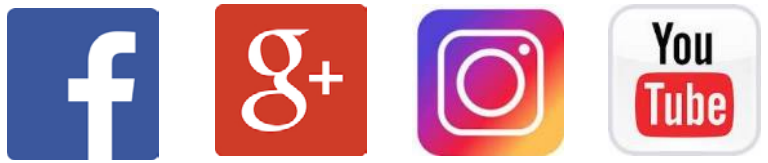
# 2022年12月- 活動報名：上天下海 玩轉奇妙顛倒世界

## 藝團介紹

跳樂劇團以製作Arts+Tech 跨媒介演出為主，作品具特色創意及趣味，讓觀眾不單以觀賞者角度欣賞，並能參與其中。劇團曾製作全港首個「STEAM兒童互動音樂劇場」，將科學、科技、工程及數學（STEM）融入藝術及音樂教育中，與學校及社區聯繫，讓觀眾可透過探索不同科技及藝術結合，啟發創意潛能。

## 計劃介紹

「上天下海・玩轉奇妙顛倒世界」為「Arts+Tech x 沉浸式劇場 x 展覽」的劇場體驗，讓觀眾在演出當中能一同參與互動，親身經歷「不一樣的世界，Wonderful World」。新科技的表演元素，配合科學天馬行空的創意實驗，貫穿整個活動。

# Thank You

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