

# STEAM Education: Virtual Reality, Creative Coding, Interactive Design

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# STEAM Education TDG Application

- Faculty-level TDG (<\$400,000)
  - Co-I: Chui Hin Leung Mike (MIT), Lei Ni Ni Lily (CCA Postgraduate)
  - Piloting STEAM courses to strengthen creative arts students' competency in applying STEM skills for artistic solutions
  - Virtual Reality, Interactive Design, ~~Creative Coding~~
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# From STEM to STEAM

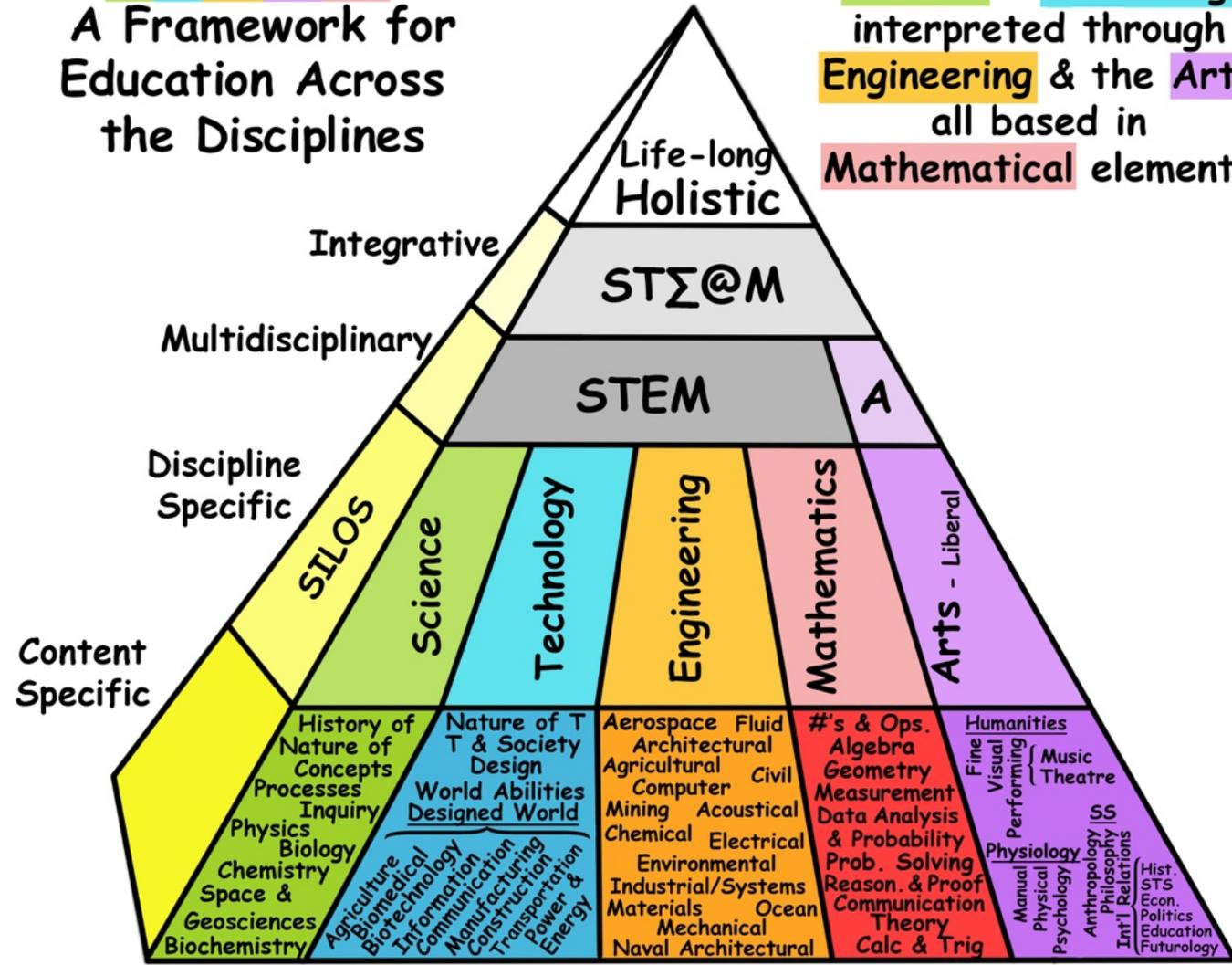
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- ~~Because there are already too many STEM projects~~
- Drawing on design principles and encouraging creative solutions
- Transdisciplinary STEM learning for arts students
- Better integration of the disciplines for arts solutions
- Scientific, computational, interdisciplinary and design thinking

# STΣ@M:

A Framework for Education Across the Disciplines

STΣ@M =  
 Science & Technology  
 interpreted through  
 Engineering & the Arts,  
 all based in  
 Mathematical elements.



Content Specific

Discipline Specific

Multidisciplinary

Integrative



# Project Objectives

1. To design and develop three undergraduate STEAM courses oriented to the areas of virtual reality, interactive design, and creative coding;
2. To adopt innovative pedagogies and interdisciplinary approaches for enhancing the learning experience of creative arts students
3. To equip students with STEAM skills including analytical skills, programming and skills, problem solving skills, creativity, cognitive flexibility, and logic
4. To build the capacity of arts students in applying computational thinking and computer-mediated creativity for arts solutions

# CAC3026

## Virtual Reality and Immersive Space in Practice



Major elective for BA(CAC) /  
Elective for others



Offered from 2018-19 Semester I



360° video shooting and editing

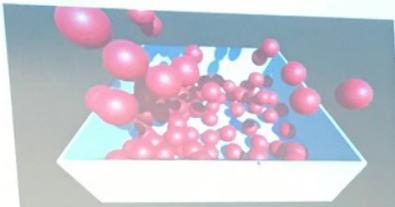


Exhibition for students' VR artwork



# Pre-work: 360° Cantonese Opera

In-class exercise 1: Make a 波波池





The exhibition discusses immersive entertainment design and VR experiences by a group of student artists who participated in the virtual reality and immersive design course at The Education University of Hong Kong (EduHK) in late 2018.

The use of immersive technology such as VR, games and virtual entertainment development platform have made possible an immersive approach to design and experience differently the content of stories told by the artists and their artistic solutions, which reflect the innovative and immersive dialogue between the artworks and the audience.

展覽探討了沉浸式娛樂設計和VR體驗，由一組參與了香港教育大學（教大）於2018年底的虛擬現實及沉浸式設計課程的學生藝術家所創作。

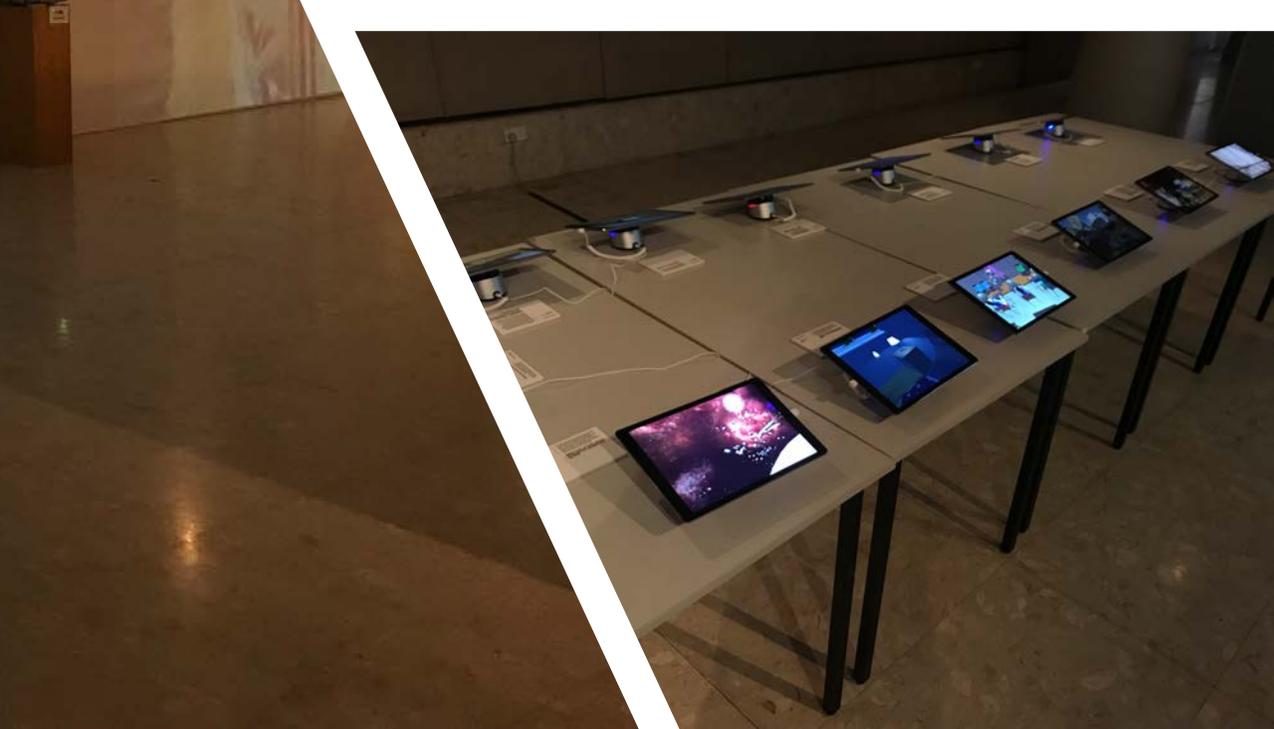
VR、遊戲及虛擬娛樂開發平台的使用，使藝術家能以沉浸式的方式設計和體驗內容，並透過藝術家的藝術解決方案，反映藝術作品與觀眾之間的創新及沉浸式對話。

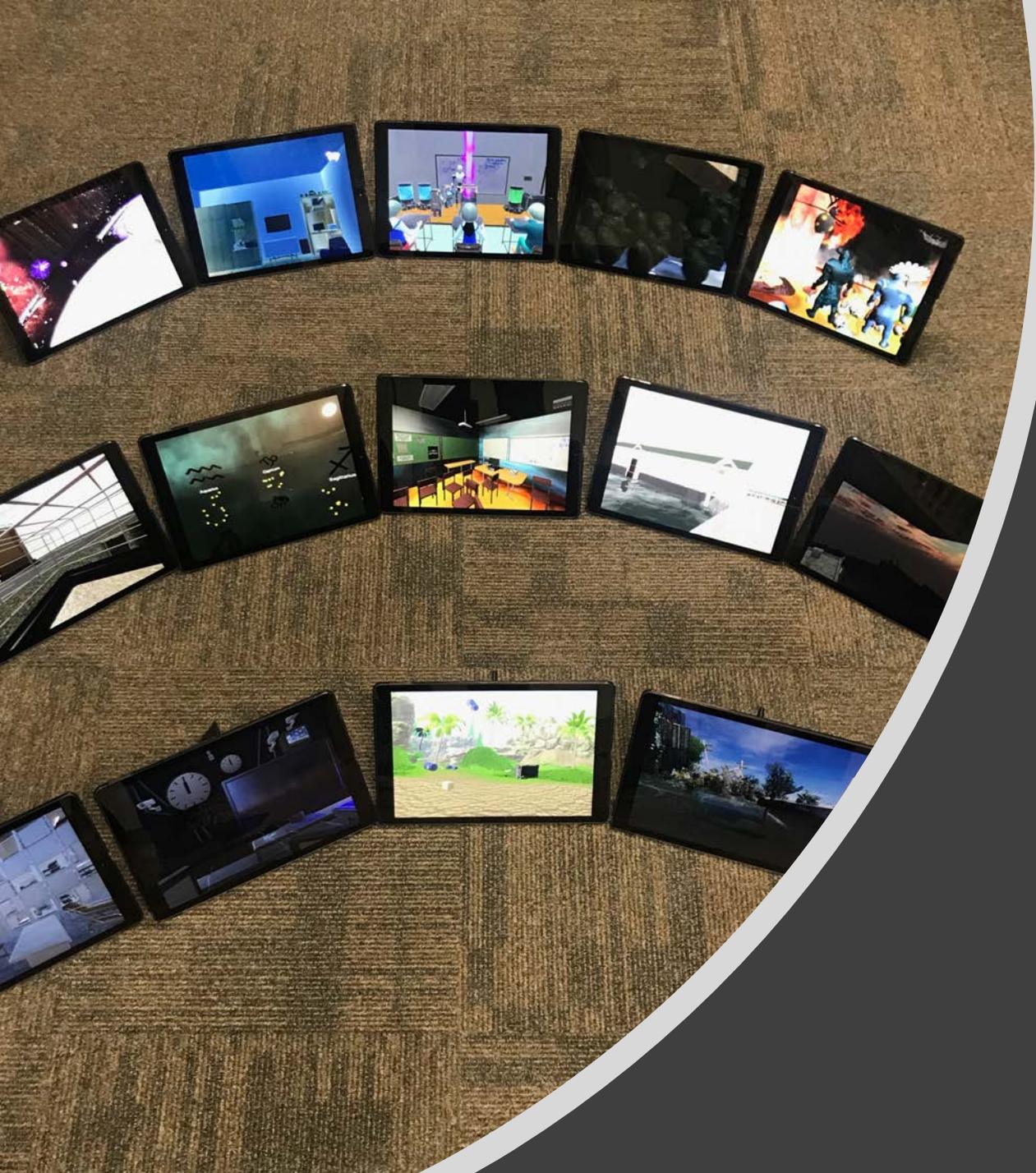
# Dialogue Immersive

沉浸式的藝術對話

18.01 - 21.01  
. 2019







Online  
Teaching &  
Learning  
Materials  
for *Unity*

# 360° Photography and Drawing



Post-work:  
VR Drawing  
Performance





# Extra work: Lunar New Year Media Reception

# Conference Presentation



**GEL1004**  
**Exploring**  
**Interactive**  
**Design**

**Experiential Learning Course (ELC)**

**For the new GE curriculum**

**Offered from 2019-20 Semester I**

**Lecture – 9 hours**

**Experiential Learning – 24 hours**

**Sharing/Presentation – 6 hours**

Experiential  
Learning  
Activities

**Activity**

**Content**

Workshops on  
Electronics

Arduino, Raspberry Pi

Visit to Exhibition

Microwave New Media Festival

Let's go shopping 😊

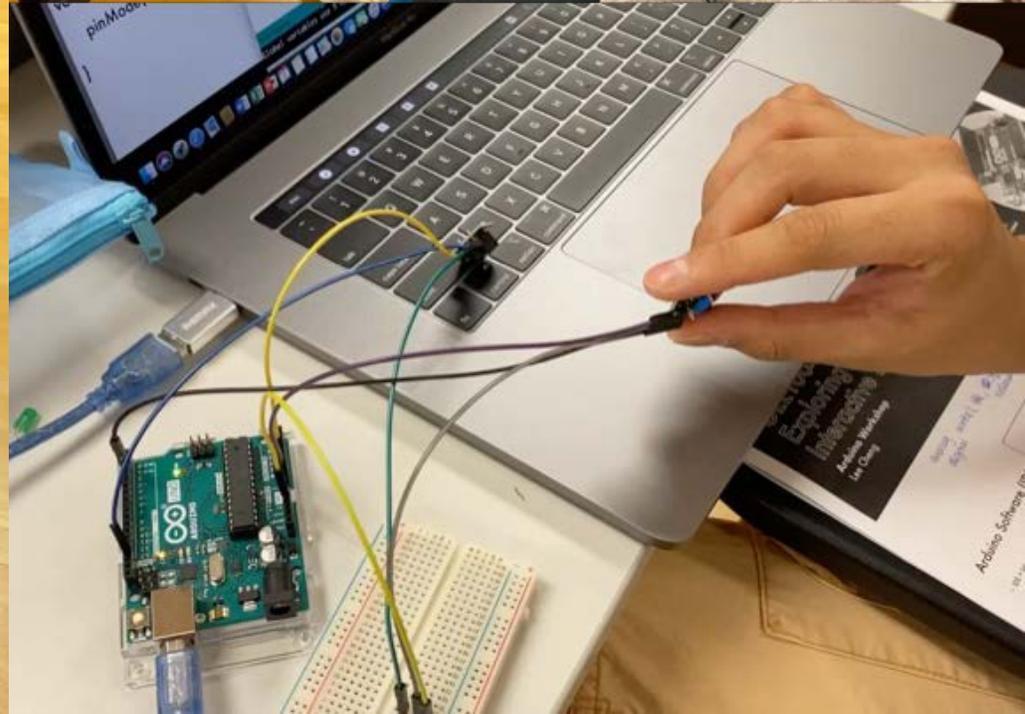
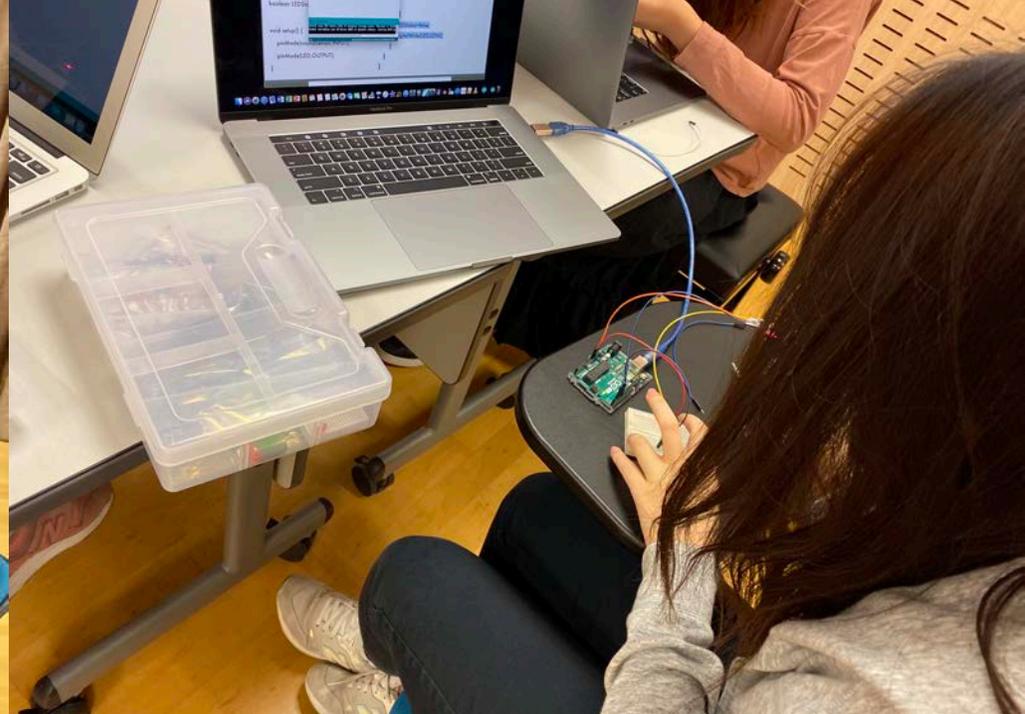
Apliu Street to purchase  
electronics for their project

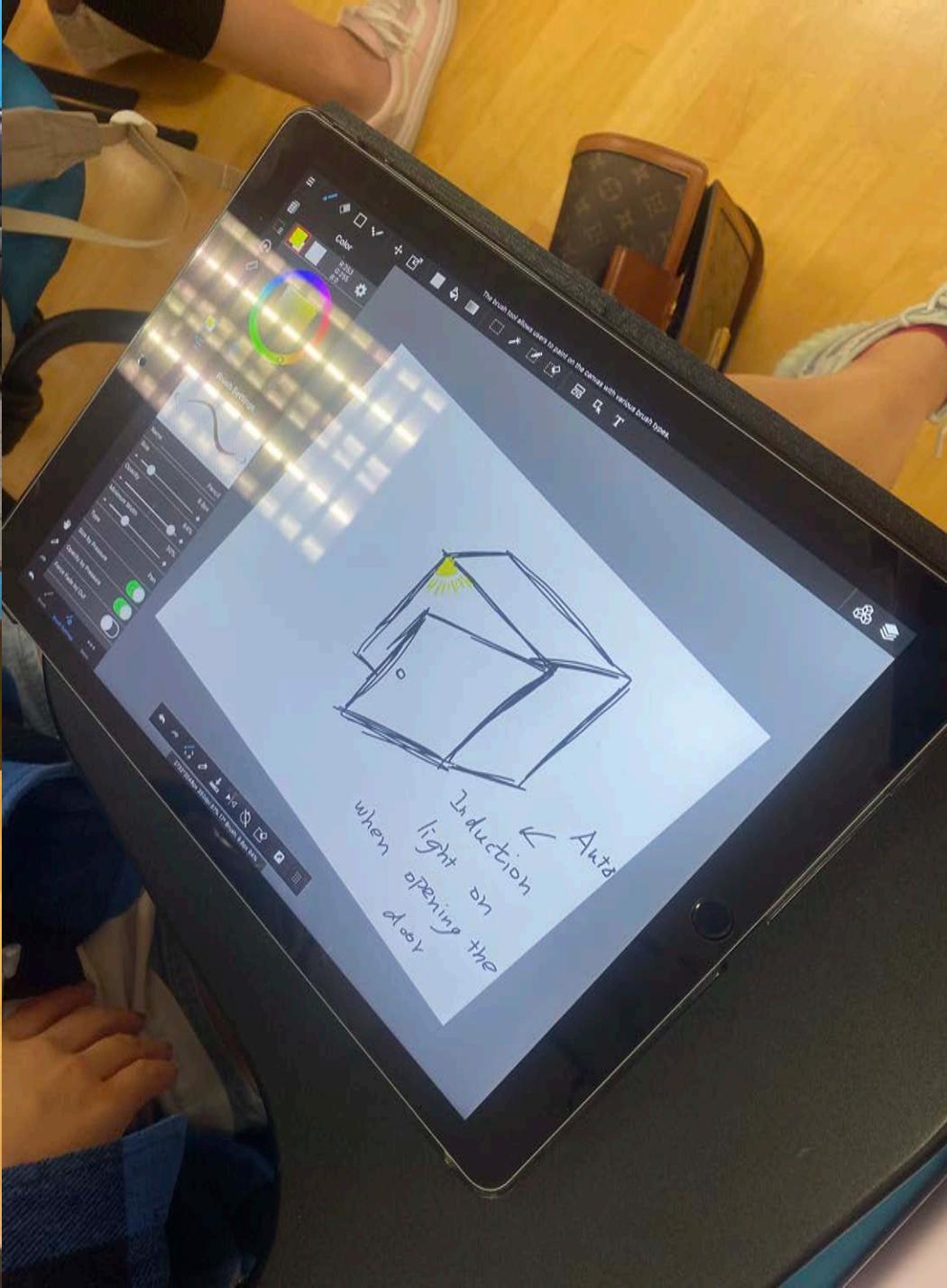
Artwork making

Design and implementation

Exhibition

EdUHK CCA Gallery





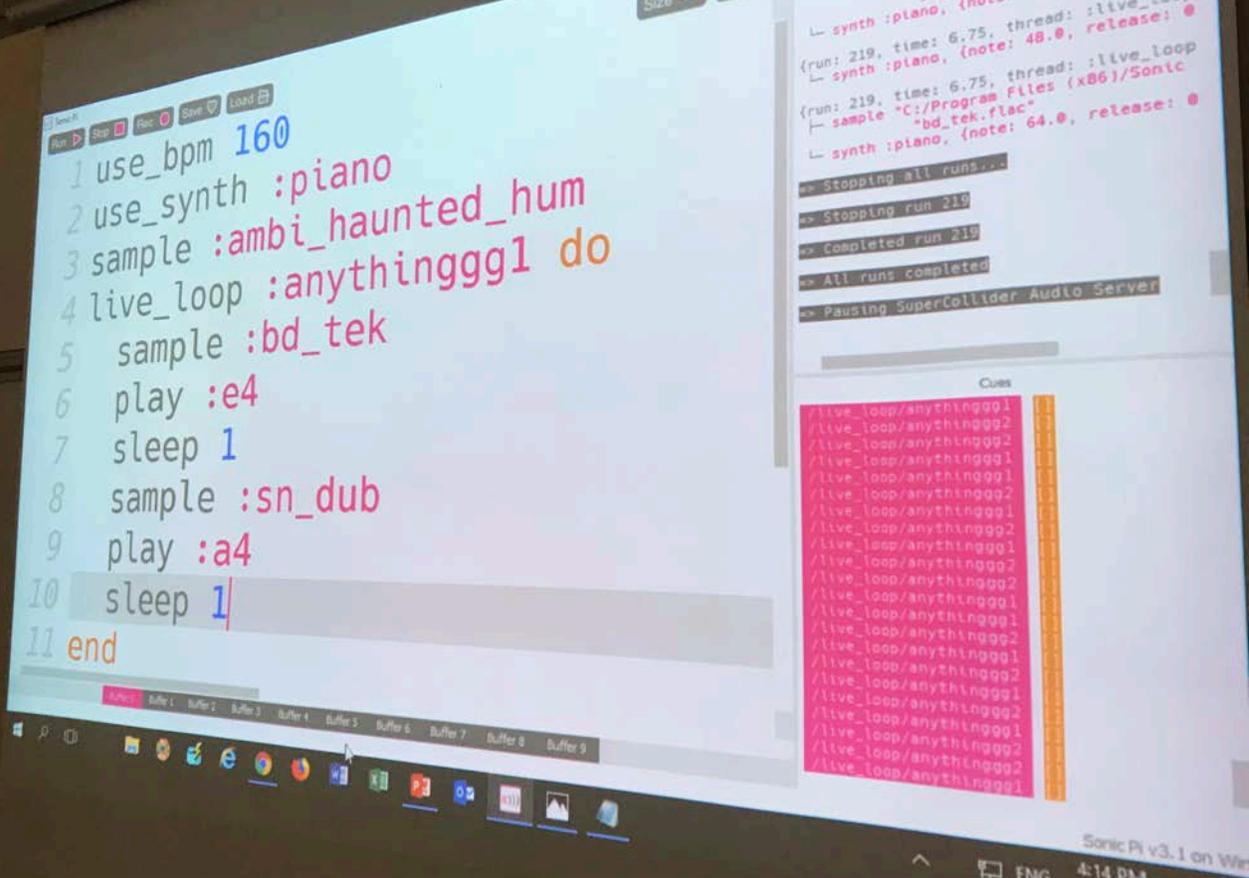
13-16 June



賽馬會運算思維教育  
編程嘉年華 Coding Fair  
香港教育大學

編程工作坊  
編code編曲 音樂創作工作坊  
Music-making with Coding

鄭重言博士 Dr. Lee Cheng  
文化與創意藝術學系 Department of Cultural and Creative Arts



# Sonic Pi Coding Workshop

## Coding Fair 2019

# CACxxxx ~~Creative Coding~~

## Technology and Coding for Creative Industry

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- Proposed course in progress, to be offered next academic year
- Both coding and hands-on development platform
- e.g. HTML vs. Website Builders (Wix, Google site...)
- Internet of Things (IoT), live streaming and broadcasting, audio and visual systems, visual and audio coding

# Research Output on Music Coding Education

[HOME](#) / [ARCHIVES](#) / [VOL 10 NO 1 \(2018\): ALGORITHMIC EDM](#) / [From the Floor](#)

## Teaching Live Coding of Electronic Dance Music: A Case Study

**Lee Cheng**

The Education University of Hong Kong

**Keywords:** EDM, live coding, pedagogy, music education, performance technology

VOLUME 10 NUMBER 1 2018

ALGORITHMIC ELECTRONIC DANCE MUSIC

McLean, Fanfani & Harlizius-Klück explore rhythmic patterns in ancient Greek weaving & live coding • Joanne Armitage negotiates gender, community & technology in algorave • Richard Savery analyses an interactive algorithmic system • Smith and Lawson reflect upon The Force

FROM THE FLOOR • Lee Cheng teaches live coding • Ocelotl, Del Angel and Teixido introduce RGGTRN • Renick Bell explores limits of algorithmic dance music • ALGOBABEZ write code and push buttons • Alexandra Cardenas composes with live code • Chris Keifer performs between code and controllerism • Esteban Betancur Guterrez algoraves in Medellin

REVIEWS of Girl; Weekend Societies; Frankenstein Goes to Holocaust; Popular Music, Digital Technology and Society; and Playing with Something That Runs

with Guest Editors Shelly Knotts and Nick Collins

# Dissemination & Deliverables

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Three STEAM courses	2/3
TDG Seminar	Doing it now
Working	✓
Conference Presentation	✓
Teaching & Learning Package (Website)	✓
Journal Publication	✓
Exhibition	✓

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# Self-reflection / Recommendation

- Be realistic in the TDG application
- Quality more important than quantity
- Is the amount of budget applied a problem?
- Keep the project progress in mind
- Sustainability for further development

