Multi-user Internet Narrative Environment of HKU (MineHKU) for Smart City Courses and Virtual Campus Events

Enrichment of e-learning of smart city courses and online campus activities with a gamified virtual campus

Dr. Fan XUE
Dept. of Real Estate and Construction, HKU
xuef@hku.hk

Prof. Anthony G.O. YEH
Dept. of Urban Planning and Design, HKU
iyschan@hku.hk

Dr. Isabelle Y.S. CHAN
Dept. of Real Estate and Construction, HKU
iyschan@hku.hk

Introduction

Endangered heavily by the 2019-20 social unrest and the Covid-19 pandemic, online courses are indispensable land to HKU's teaching and learning (T&L) atlas. Yet, the online meeting software, e.g., Zoom, is limited in delivering 3D content regarding smart city and students' interactions. This project aims to develop MineHKU for new 3D interactive T&L content. The MineHKU employs a world-leading sandbox game environment Minecraft Education Edition (MCEE, *free of charge to HKU accounts*). MineHKU also extends smart city courses with programming and multi-user interactive functions based on MCEE.

Objectives

✓ To facilitate educators develop and manage new 3D interactive T&L contents regarding smart city courses;
✓ To enrich students' learning of complicated urban systems with youth-friendly gamified interfaces;
✓ To contribute a new form of virtual environment for hosting students' and university events, especially for online teaching.

Contents

✓ Experiential learning with 3D MineHKU.
  1. 3D surveying and as-built modeling. See Figure 1. Note that the model was semi-automatically created using 3D dimensions and Python codes.
  2. Underground facility. See Figure 2.
✓ Virtual campus events.

Findings

✓ Students love MineHKU;
✓ MCEE is available for laptop, iPad, phones;
✓ Every student enjoyed interactive T&L with friends;
✓ MCEE offers measurement APIs for block types and quantity (e.g., for materials and CO_2 estimation);
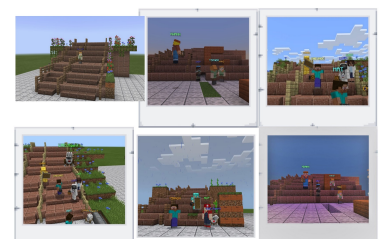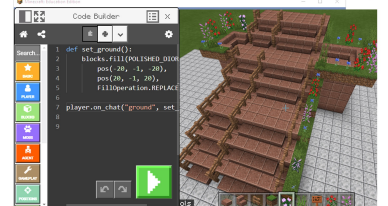

Figure 2. MTR West Island Line under Loke Yew Hall at MineHKU

Figure 1. SYS Steps: 3D LiDAR surveying and collaborative design

Deliverables

✓ A base virtual campus MineHKU in MCEE, free for HKUers at TDG Res Hub: https://tdg.hku.hk/hub/
✓ New T&L contents for RECO7613, RECO2041, etc.
✓ Project report.