SMART ENVIRONMENT

ACTIVITY RECOGNITION

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**INNOVATIVE
ENGINEERING**

SMART ENVIRONMENT RESEARCH IN UTB

- Smart City:
  - Crowd Simulation in 3D Virtual Environment
  - Mobile Health Monitoring
  - Intelligent Surveillance System
  - Smart Traffic Management
- Smart Agriculture:
  - Blast Disease Screening in a Paddy Field
- Smart Education
  - Mathematics Wall
  - Enhance Science education through AR/VR

ACTIVITIES RECOGNITION

- Activity recognition aims to recognize human activities e.g., location estimation, intent recognition, behaviour recognition.

- Detection → Analysis → Recognition

- Two major approaches :
  - vision-based and sensor-based approaches.

- Representative projects:
  - Mathematics wall
  - Tracking & identifying region of interest
  - Interactive science education
  - Behavioural study

MATHEMATICS WALL

Input

123
456 +
17 −

Output

123
456 +
17 −
562

Input

235
3 ×

Output

235
3 ×
705

Input

$$\sum_{n=1}^{21} n =$$

Output

231

Input

$$2^8 + 3^2 + 5^3 =$$

Output

$$2^8 + 3^2 + 5^3 = 390$$

Input

$$6/3 + 8/2 =$$
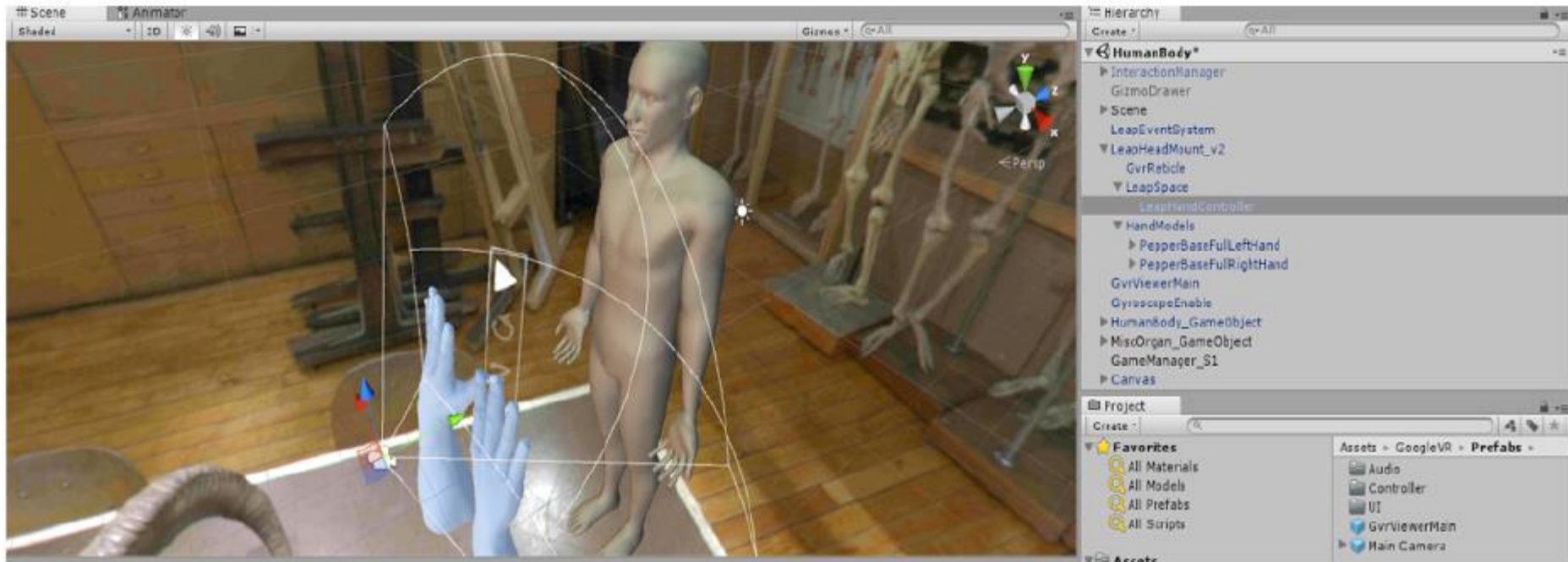
Output

$$6/3 + 8/2 = 6$$

Input

$$\int 3x^5 + x^4 + 6x \, dx$$
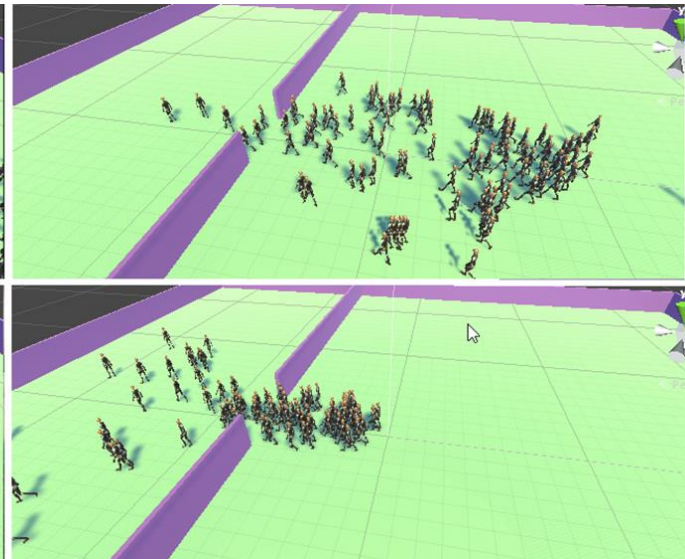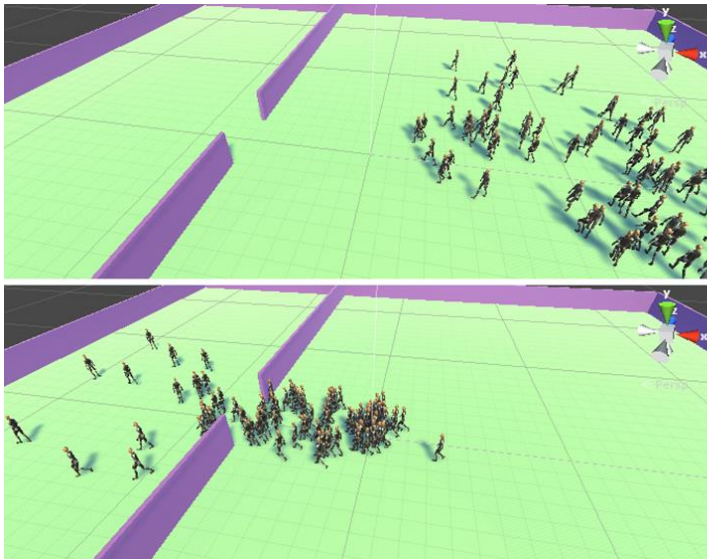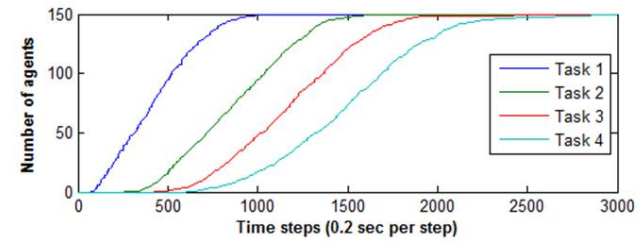
Output

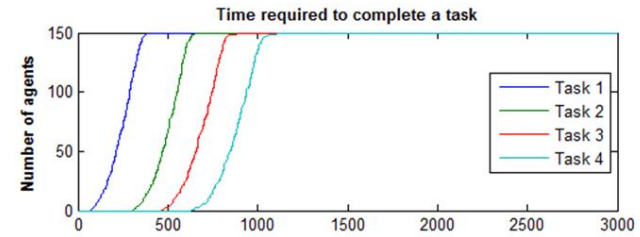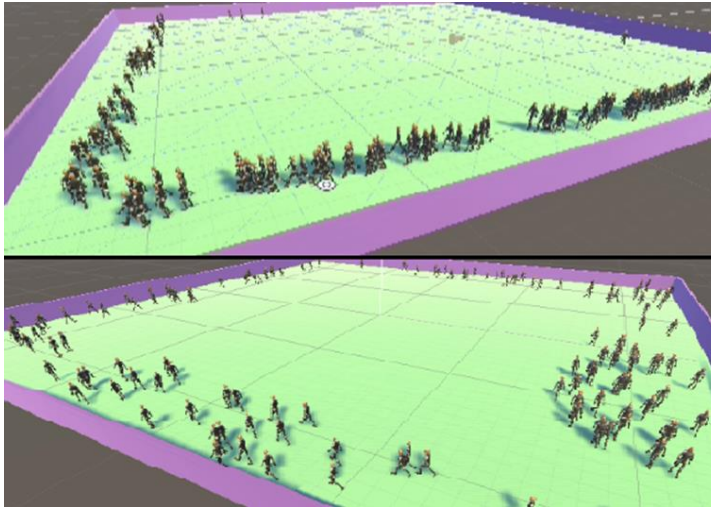$$(x^2(2x^3 + 5x^4 + 30))/10$$

TRACKING & IDENTIFYING OBJECTS

Interactive Science Education

CROWD BEHAVIOUR

Q&A
CIE Flag Ship – Areas for Connected projects