

Virtual Community: An Open World for Human, Robots, and Society

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Qinhong Zhou



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Hongxin Zhang



Xiangye Lin



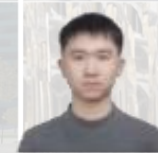
Zheyuan Zhang



Yutian Chen



Wenjun Liu



Zunzhe Zhang



Sunli Chen



Lixing Fang



Qiushi Lyu



Xinyu Sun



Jincheng Yang



Zeyuan Wang



Bao Chi Dang



Zhehuan Chen



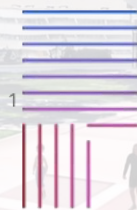
Daksha Ladia



Jiageng Liu



Chuang Gan



1 MIT-IBM
Watson
AI Lab



2 University of
Massachusetts
Amherst



3 JOHNS HOPKINS
UNIVERSITY



4 Carnegie
Mellon
University

Robots in Human Society

When humans and robots begin to coexist within shared communities...

How robots can intelligently cooperate or compete?

How humans develop social relations and build community?

How both can co-exist in an open world?



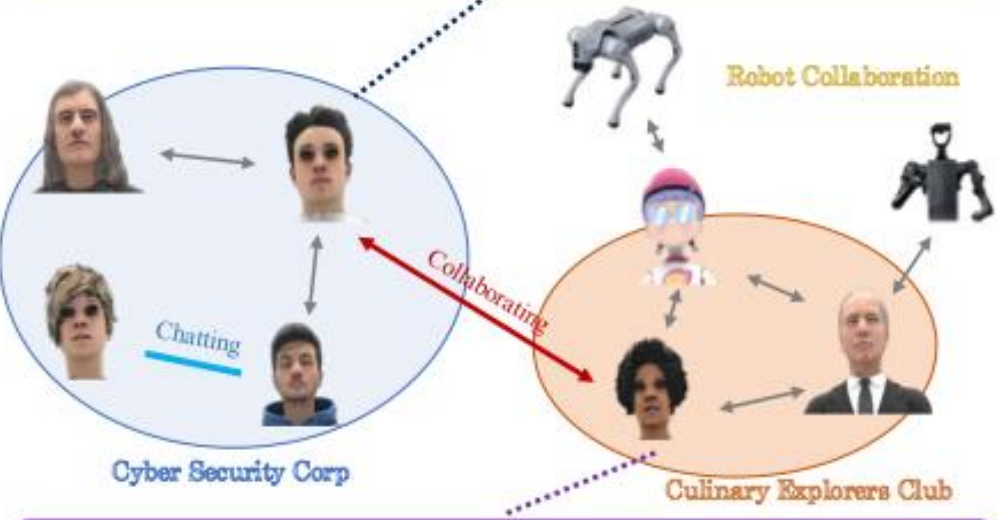
Key: Embodied physical and social intelligence

What we need: Unified simulation of robots, humans, and their communities

Robot-Human Society Simulation



Name: Leonard Park **Age:** 23
Innate: Self-direction, Security
Bio: I am a cybersecurity expert at StockX. My hobby is soccer.
Group:
 • **Name:** StockX **Place:** StockX Detroit
Living: Leonard Park's room at Justin Management



Name: Elizabeth Mensah **Age:** 35
Innate: Stimulation, Hedonism
Bio: I am a professor at Wayne State University. My hobby is cooking.
Group:
 • **Name:** Detroit Food Academy **Place:** The Gastronomy Guild
Living: Elizabeth Mensah's room at Bedrock Detroit

An open-source multi-agent physics simulator supports robots and humans within a society

Real-World Aligned Community at a Scale

Detroit, United States



Madrid, SPA



Amsterdam



London, UK



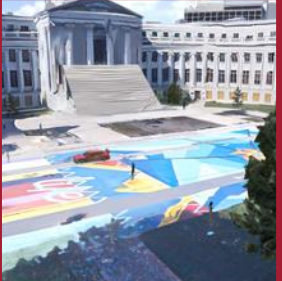
Florence, ITA



Belgrade, RS



Denver, US



New York, US

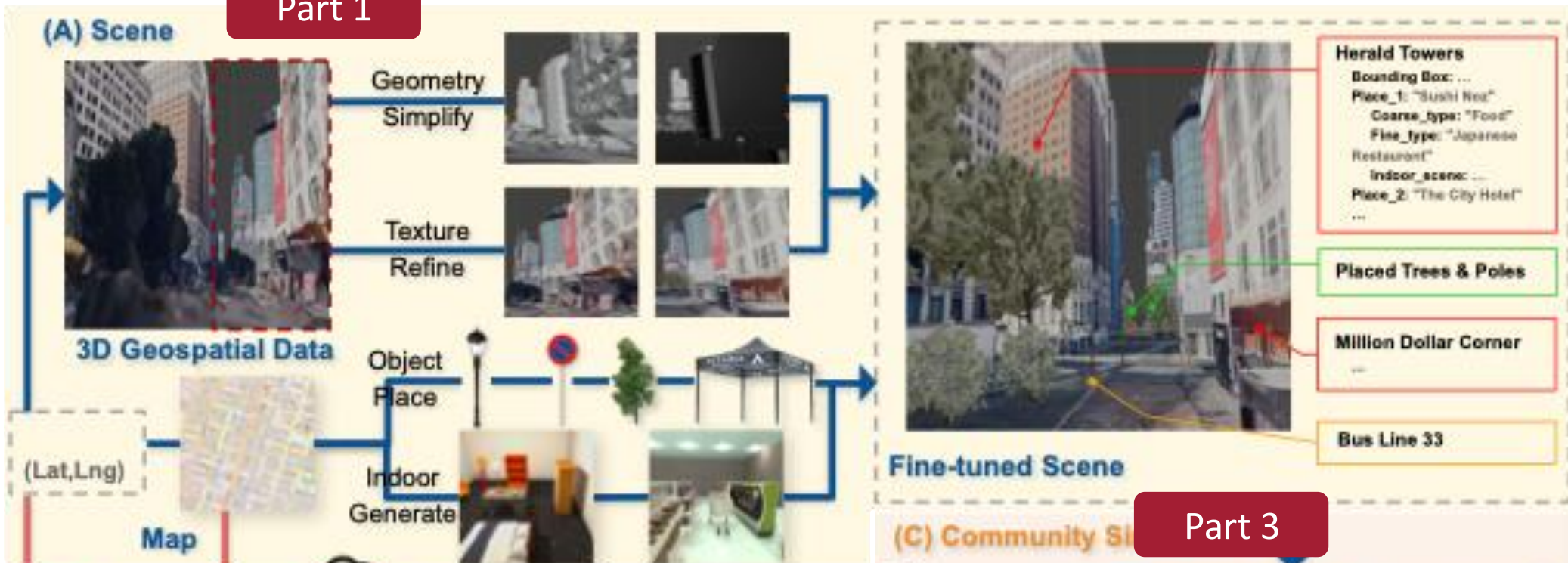


Bratislava



Virtual Community Overview

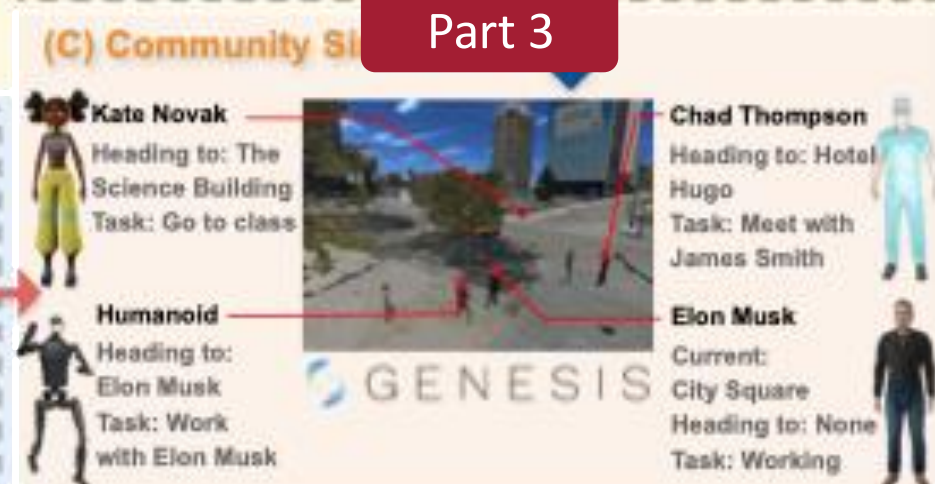
Part 1



Part 2



Part 3



Robot Agent Simulation

Based on Genesis, Virtual Community use robot controllers to support different types of robots

Newly imported

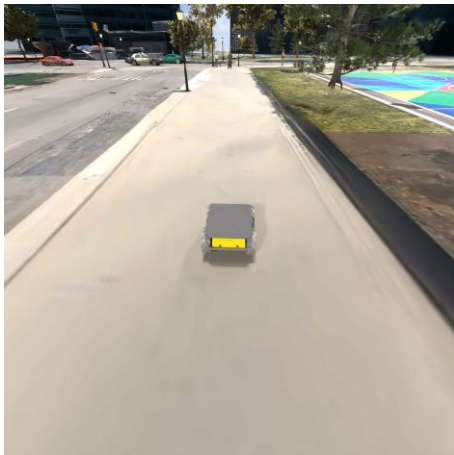
- Wheeled robot: 4-DoF Husky robot (1 per wheel)
- Mobile manipulator: 11-DoF Google Robot (move forward/backward, turn, 7 on arm, 2 on gripper)

Transferred from Genesis

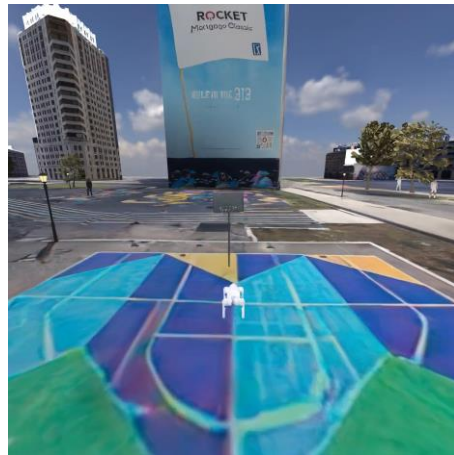
- Quadruped robot, humanoid robot, drone



GENESIS



Wheeled robot



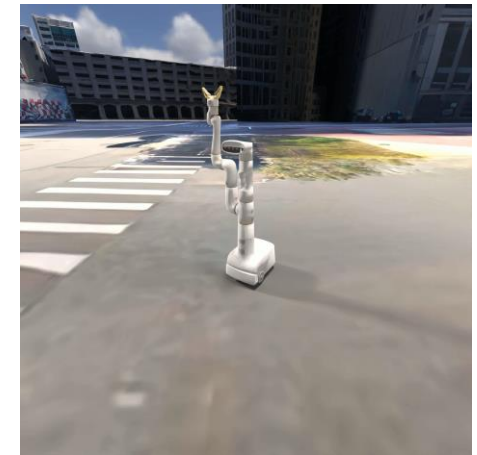
Quadruped Robot



Humanoid Robot



Drone



Mobile Manipulator