Exploration of Human-AI Teaming Concepts in Minecraft

GTRI IRAD 25

Georgia Tech Research Institute

CHIMERA - Creating Human-Centered AI/ML to Enhance Rational Advantage

TECHNICAL CHALLENGES

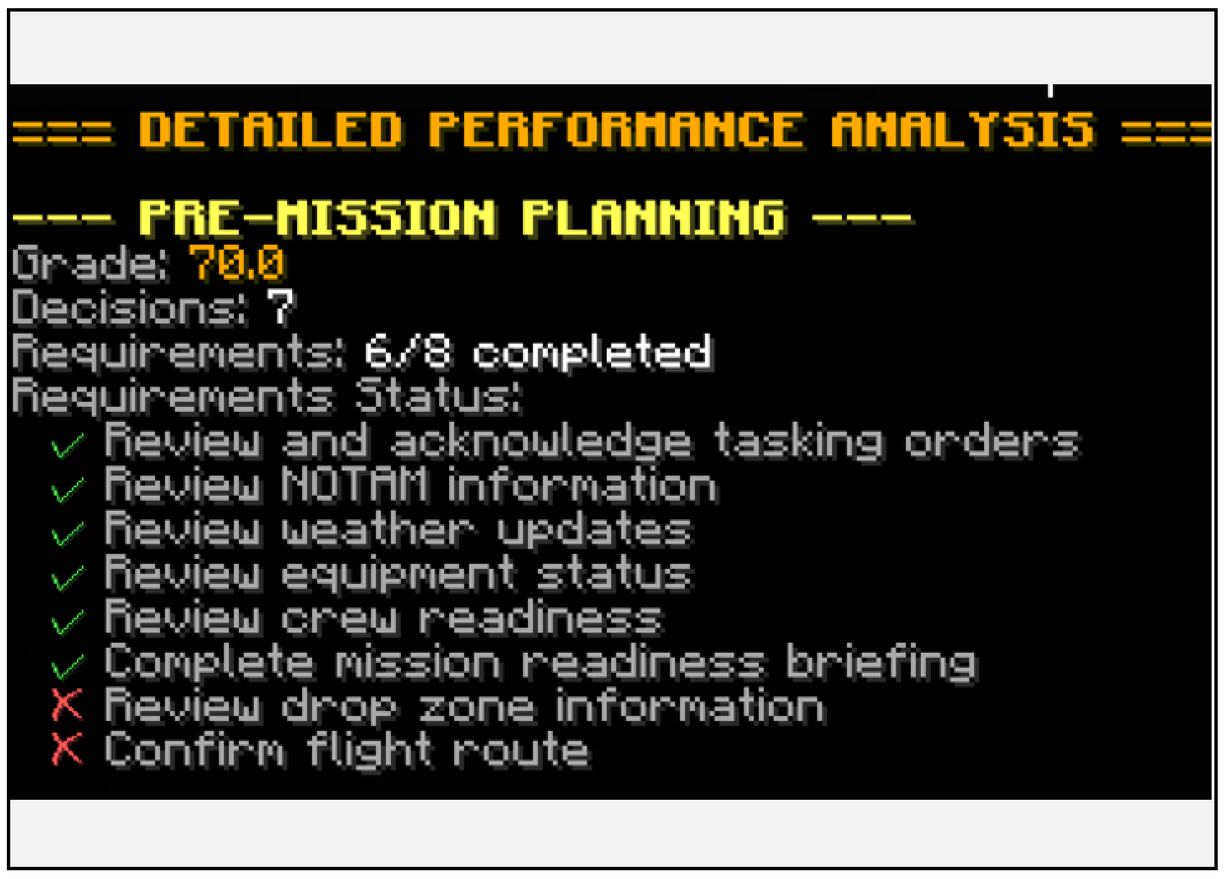
- Operationally relevant simulation software may be under strict security protocols and/or expensive
  - Overall process of ideation to simulation can be a slow, tedious process
- Lack of free programs that can be used to recreate countries in 1-to-1 scale in Minecraft
  - Insufficient computational power (e.g., only 32 GB of RAM)
- Reinforcement Learning (RL) agent interaction with modified elements

TECHNICAL APPROACH

- Previous research showcased the value of using video games for human-AI teaming research (e.g., Minecraft, StarCraft)
- Utilized Minecraft to develop a gamified C3 contingency scenario designed by Professional Masters in Systems Engineering (PMASE) 2025 cohort
  - **Mission Crew Commander (MCC) player**
  - Contingency mission, 4-person rotary wing crew to provide post-hurricane humanitarian support to **Puerto Rico**
  - Mission aligned with vetted cognitive workflows and Operational Risk Management (ORM) risk analysis

RESULTS/PROJECT OUTCOMES

- Created a Minecraft server with three complex worlds
- Enabled player actions through pre-made mods/plugins and custom scripts/mods throughout gameplay
  - Total mission score calculated based on tracked user **actions** and **decision time**
  - Player action is logged to a JSON file
- CHIMERA Minecraft sandbox will be used in future research for human-AI teaming for C4ISR decision optimization



AUTHORS: Nina Bryan, Aaliyah McElrath, Tommy Tran, Vivian Zhou
COI: Command, Control, Communications, Computers, and Intelligence (C4I)

Contact: Dr. Courtney Crooks: Phone: (404) 407-8514;
Email: courtney.crooks@gtri.gatech.edu