Voxel Populi:
A Decentralised Peer-to-Peer Voxel-Based World

Samuel J. Sully (sjs252)

Lent 2020

Project Description

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- Unity graphical client – interact with world
- Alternative to usual client-server model for MMOs
- Aim for load balancing, failure tolerance & longevity

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- ► Work Completed:
    - ► Kademlia DHT
    - ► Game server
    - ► Graphical client

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- Work Completed:
  - Kademlia DHT
  - Game server
  - Graphical client
- Work Remaining:
  - Improve robustness
  - Evaluation client
  - (Extensions)

Demo

```
https://drive.google.com/file/d/15Uw_
DwdCLs7KNedXpSnNxYbRyq6f_Obt/view?usp=sharing
```

Planned Extensions

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▶ Node failure – prevent loss of chunks

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- In-world entity – boids?

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Evaluation

- Comparison with Kademlia specification
- Testing at scale with AWS and test client
- Use data from (2) to estimate performance at MMO scale
- Stress test of individual server
- Analysis of resilience to various faults (e.g. Sybil, Byzantine)