

Name	ID0	ID1	Key Responsibilities in the area of Networking (i.e. what each individual was in charge of. Everyone touched everything, no one slacked)
Chloe Lim Jia-Han	j.lim	440003018	<ul style="list-style-type: none"> <li>• Winsock API wrapping</li> <li>• Dead-reckoning (with Javier)</li> <li>• UDP sending and receiving (with Edwin)</li> </ul>
Edwin Khoo Bing Shen	b.khoo	390001918	<ul style="list-style-type: none"> <li>• UDP sending and receiving (with Jia-Han)</li> <li>• Lock-step <ul style="list-style-type: none"> <li>○ Custom hash function</li> <li>○ Packet validation</li> <li>○ Cheat prevention (sending organization and receiving checks)</li> </ul> </li> </ul>
Javier Foo	javier.foo	440002318	<ul style="list-style-type: none"> <li>• Dead-reckoning (with Jia-Han) <ul style="list-style-type: none"> <li>○ Prediction</li> <li>○ Inaccuracy handling</li> <li>○ Synchronization of game objects and data</li> </ul> </li> </ul>

### Brief Summary highlighting how network communication is handled by the game

- Data exchanged is kept to what the user manually modified, what is predicted, and game state changes
  - All info:
    - 1 char- game end status: "0" if game is ongoing, else "1"
    - 1 char- score update status: "1" if score is to be updated, else "0"
    - 1 char- ball update status: "1" if ball data is to be updated, else "0"
    - 2 floats- player position
    - 2 floats- ball position
    - 2 floats- ball velocity
  - If game end status is "1", no other information is sent
  - If ball update status is "0", ball position and velocity are not sent
  - Player moves via translation, so only player position is sent
  - Ball moves with basic velocity. Ball position and velocity are only sent when there is a collision or reset (ball went out of bounds). Intermediate movement is handled locally via prediction
- Data is only sent when there is a game event that occurs. Every player is responsible for their own side (their paddle's collision with the ball and the ball going out of bounds on their end) to save time on calculations and checking for every player while potentially minimising conflicts in update on the same player. Game events include:
  - Ball collision with paddle. Data is sent here and not relied upon by prediction even though every paddle info should be updated in real time to ensure that should there be an error in prediction it could be handled immediately (snapping).
  - Ball going out of bounds. Score update status would be set to "1" here and every other player would add 1 to their score.
  - Game Ended. No one should be playing if there is no active game.

### Extra

- Warnings are from glm, code we neither authored nor dare to touch.