

Online Gaming

- Up to thousands of players play in the same virtual world
- Players interact with each other and the world
- Networking components of games rely on decade old technologies
- Networking of online games is challenging since QoS requirements are high

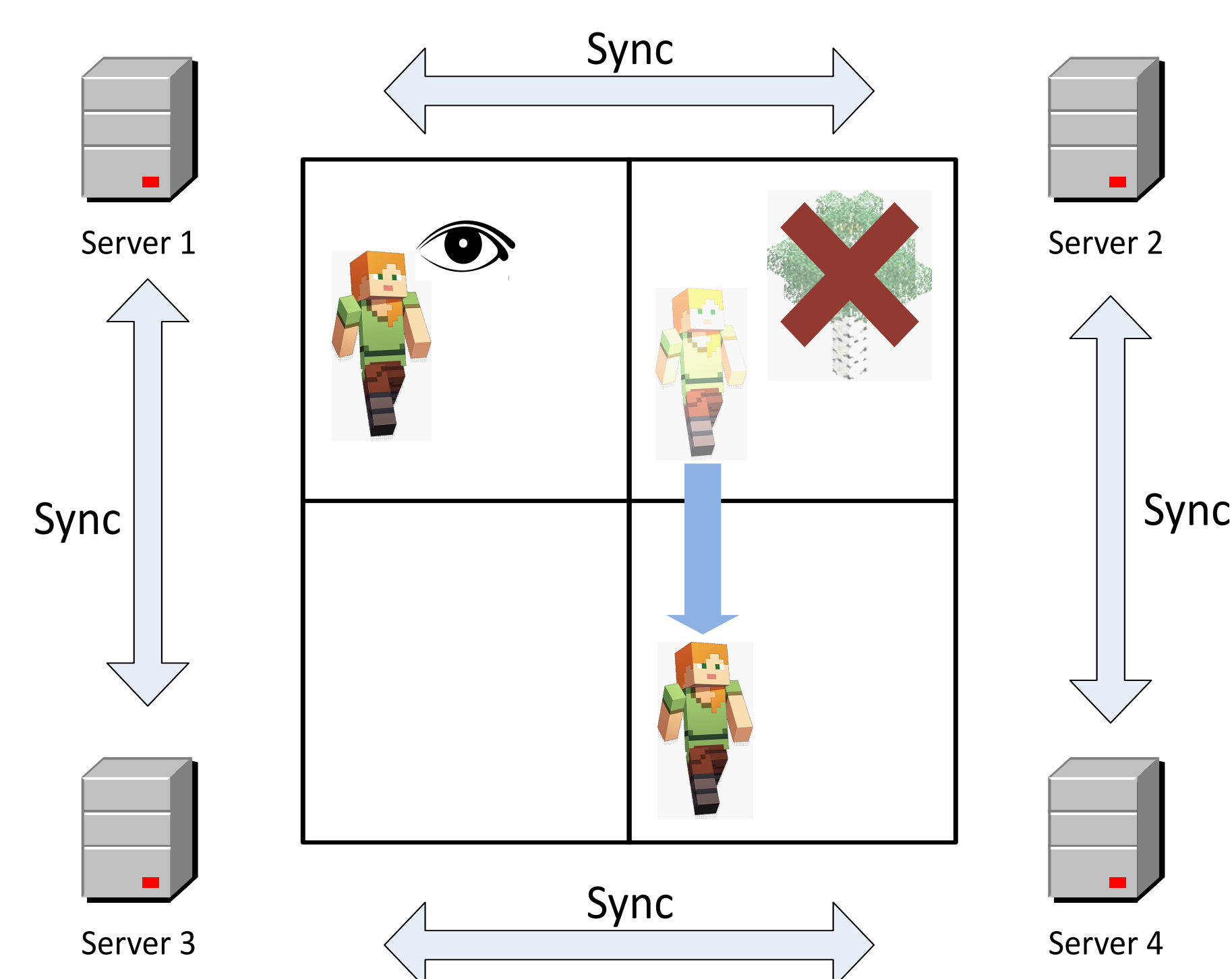
Why use ICN?

- Huge multicasting benefits expected when using NDN
- Game world information is perfectly suited for named access
- Host-independent map structure allows higher scalability
- Adaptable to decentralized (P2P) architectures

Our Work

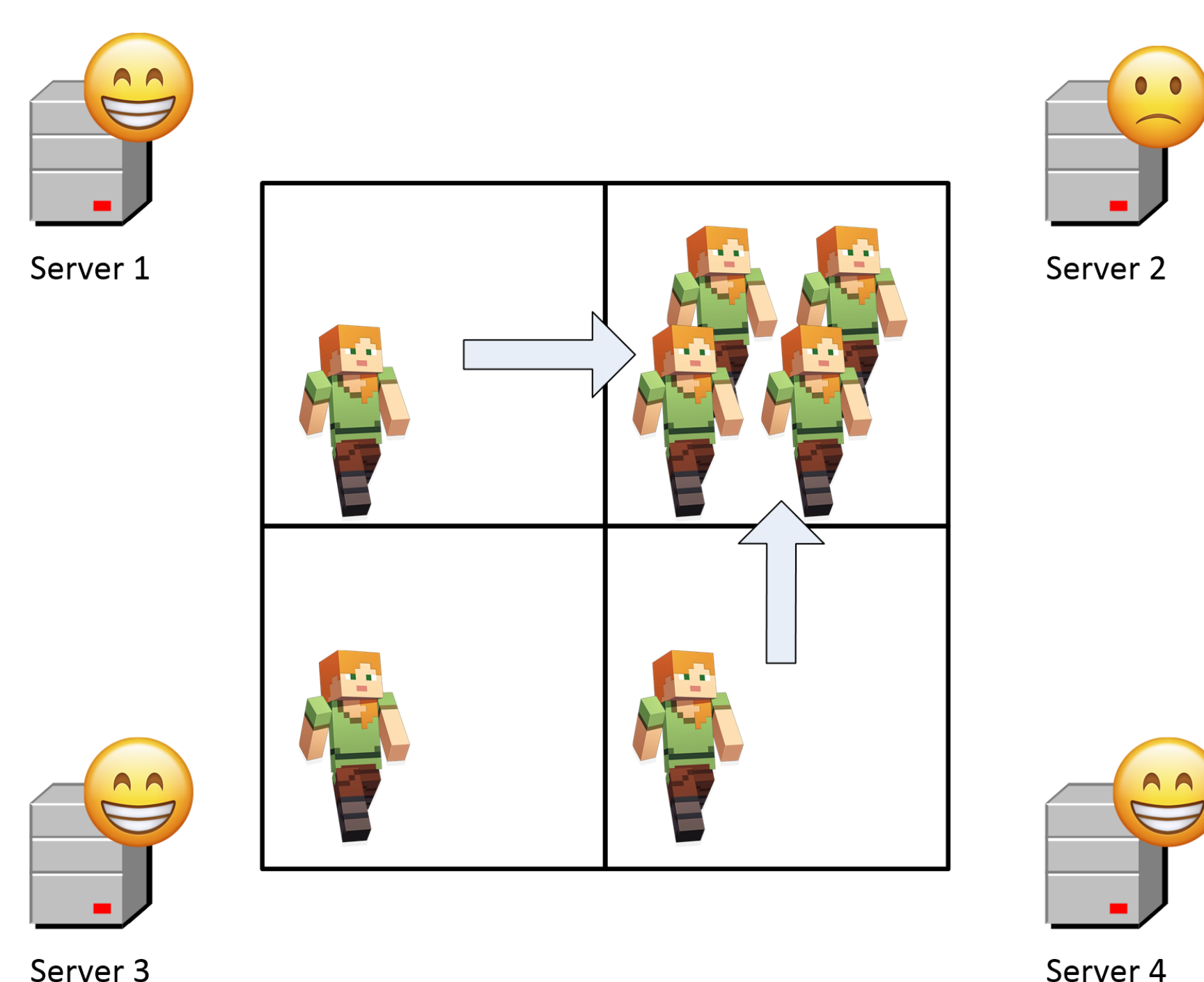
- We are currently developing a prototype for an NDN-based gaming architecture
- The prototype is based on the online game Minecraft
- Our prototype demonstrates NDN's capabilities in a playable online game.

Architectural Components of the Envisioned System



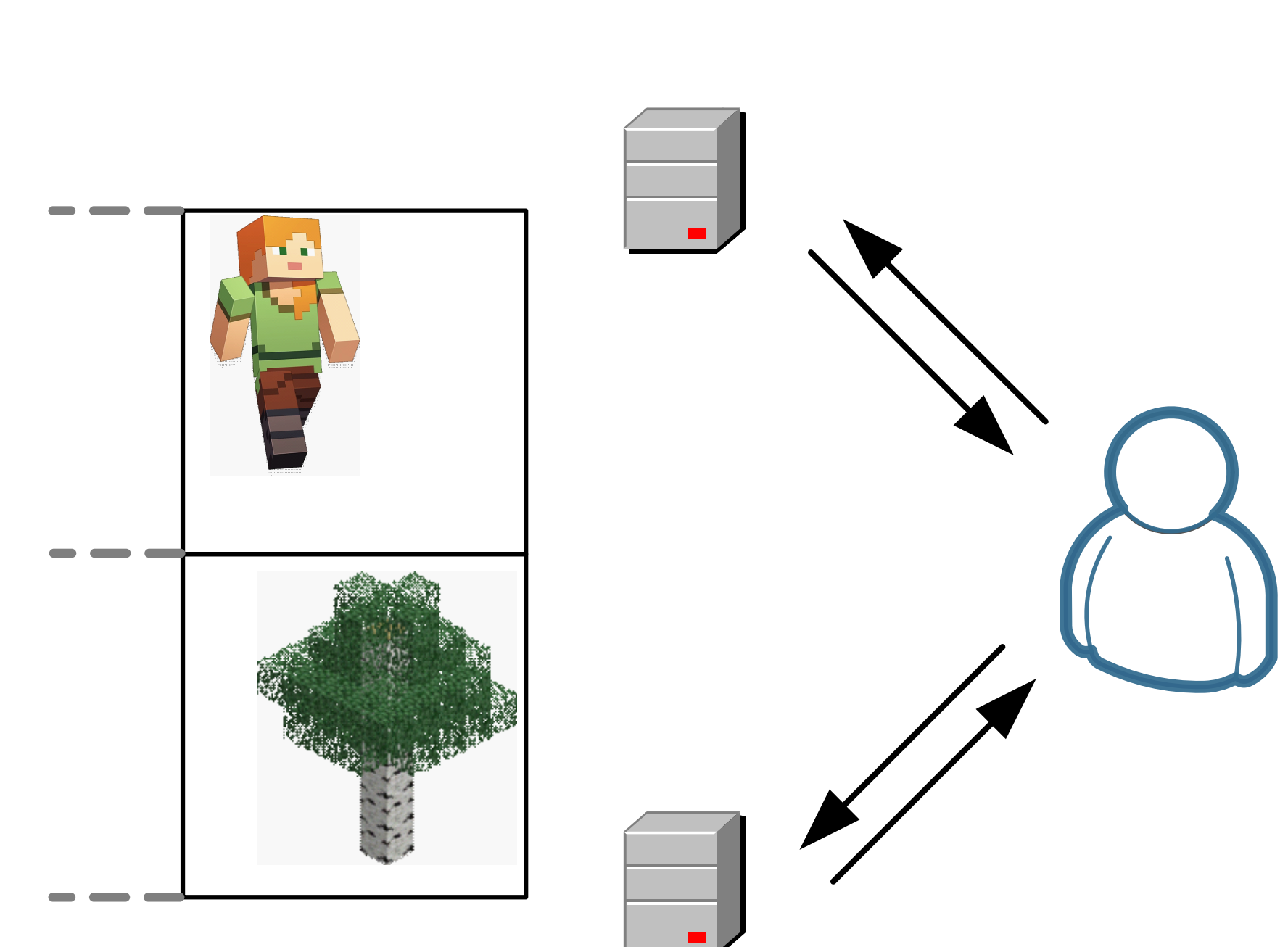
Inter-Server Game State Synchronization

- Synchronizes the state of game worlds in server clusters
- Increases scalability and resilience
- NDN's multicast functionality reduces synchronization traffic
- Benefits increase with increasing number of servers



Dynamic Zone Size Adaptation

- Allows server-region assignments to change during a game
- Supported by a host-independent naming scheme, that decouples regions from servers
- Eases load balancing and reacting to server failures



NDN-based Client Communication

- Connects clients to the distributed world via NDN
- NDN enables querying data independent of the server
- Multicasting benefits expected, since nearby clients require the same data

Current Status

- First version of inter-server game state synchronization finished
- Currently working on a naming and synchronization approach applicable for huge worlds
- Dynamic zone size adaptation and client connections are future work.

Lessons Learned So Far

- Working with huge game worlds quickly shows the importance of scalable solutions
- Packets with small payload suffer from NDN's protocol overhead (Interests, Data packet header)
- Wide range of available NDN tools allows rapid prototyping and evaluation of novel approaches

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