

# Towards Crowd-Sourced Collaborative Fragment Matching

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## Context

- Many artifacts preserved only as sets of fragments
- Laborious manual reassembly process
- Fully automatic reassembly methods do not guarantee correctness
- Incorporate broad public to solve this complex task collaboratively



Web-based 3D environment, visualizing fragments of an archaeological artifact for virtual reassembly

## Research Questions

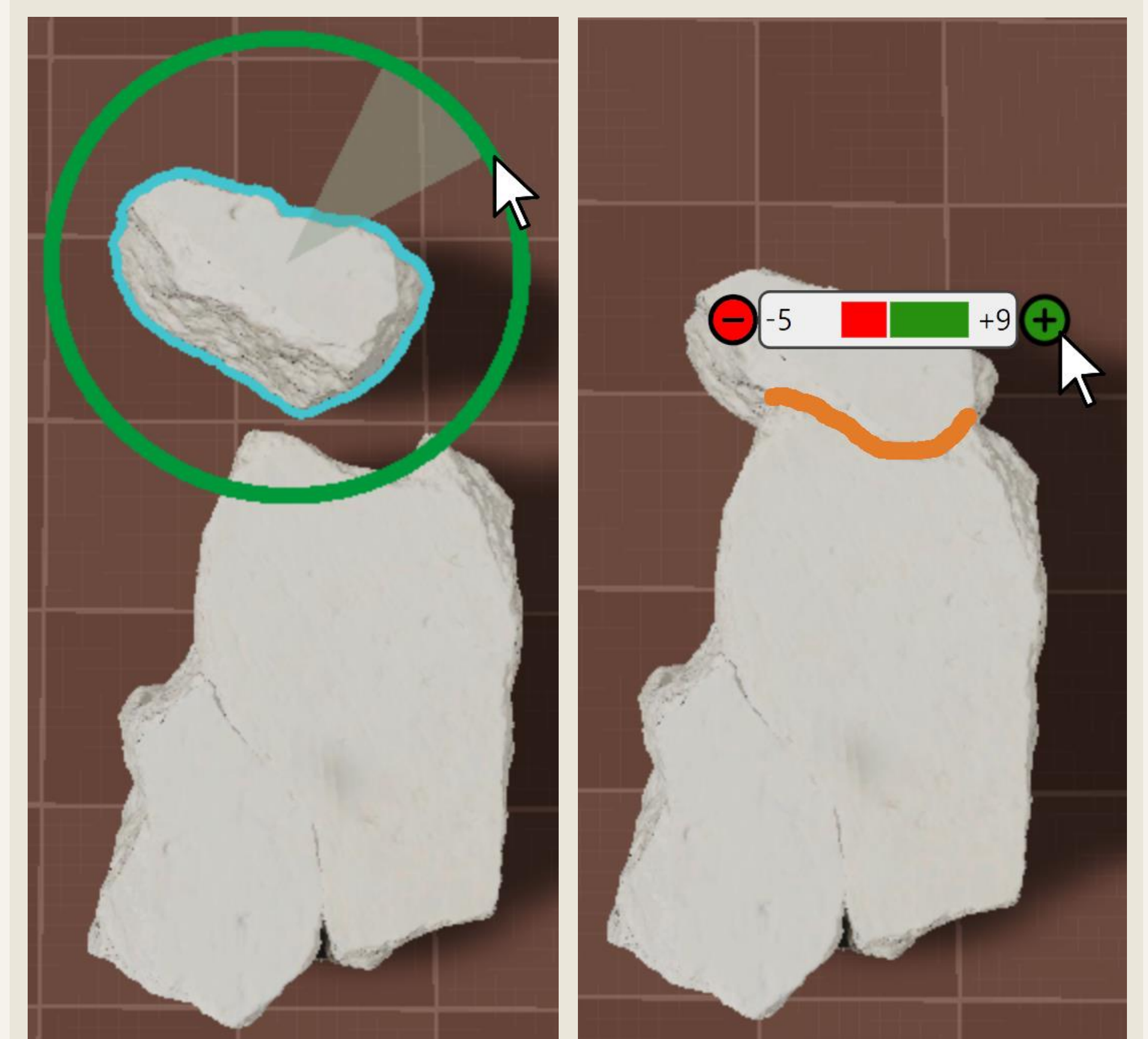
- How to measure collaborative reassembly efficiency?
- What is the ideal number of collaborating participants to solve the problem most efficiently?
- Do algorithmic aids (fine registration, automatic snapping of nearby fragments, ...) improve or hinder solution progress and user motivation?

## Methodology

- Create web-based 3D environment to enable easy access for users to collaborate
- Distribute participants in virtual rooms
- Measure progress by number of correct matches over time (ground truth is known)
- Log progress and user actions in each room

## User Interaction

- Users can move & rotate stones, and adjust lighting parameters to reveal surface details
- Color-coded display of calculated geometric error for proposed fragment matches
- Users can up-/downvote joins in a standardized, non-offensive way



Placing fragments, proposing joins, and sharing opinions

## Expected Results & Contribution

- Collected data after user study will enable statistical analysis of collaboration performance
- Stone fragments digitized for this project will be made publicly available
- Developed platform shall be used for other datasets for which ground truth is not yet known
- Raise awareness of our cultural heritage in the broader public