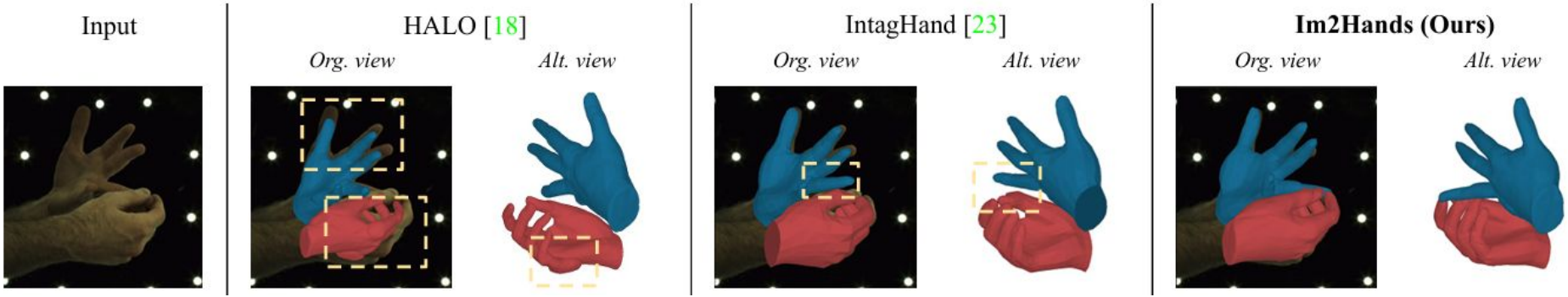
Lee, Sung, Choi, Kim. Im2Hands: Learning Attentive Implicit Representation of Interacting Two-Hand Shapes

What is the problem?

The task is to reconstruct the 3D shapes of interacting two hands from a single RGB image, a complex problem due to hand-to-hand occlusions and collisions.

What has been done earlier?

- Previous methods like IntagHand and Two-Hand-Shape-Pose used mesh-based models with fixed topologies, which failed to capture fine details.
- These techniques produced low-resolution hand shapes and often lacked realistic hand-to-hand interactions.



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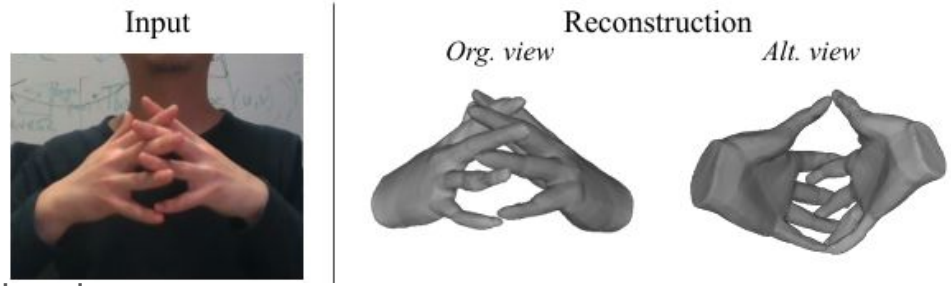

What are the remaining challenges?

- Capturing fine details of hand interactions.
- Handling occlusions and collisions between hands.
- Generating high-resolution, coherent reconstructions without noisy keypoint predictions.

What novel solution proposed by the authors to solve the problem?

- The authors introduce the first neural implicit representation for interacting two-hand shapes.
- Key Innovations:
    - **Attention-based modules:** Used for initial occupancy estimation and refining hand shapes with interaction context.
    - **Resolution-independent outputs:** Captures precise details of hand shapes.
    - **Keypoint Refinement:** Reduces errors from noisy input keypoints, leading to more robust shape predictions.

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