

Fast and Robust Hand Tracking Using Detection-Guided Optimization

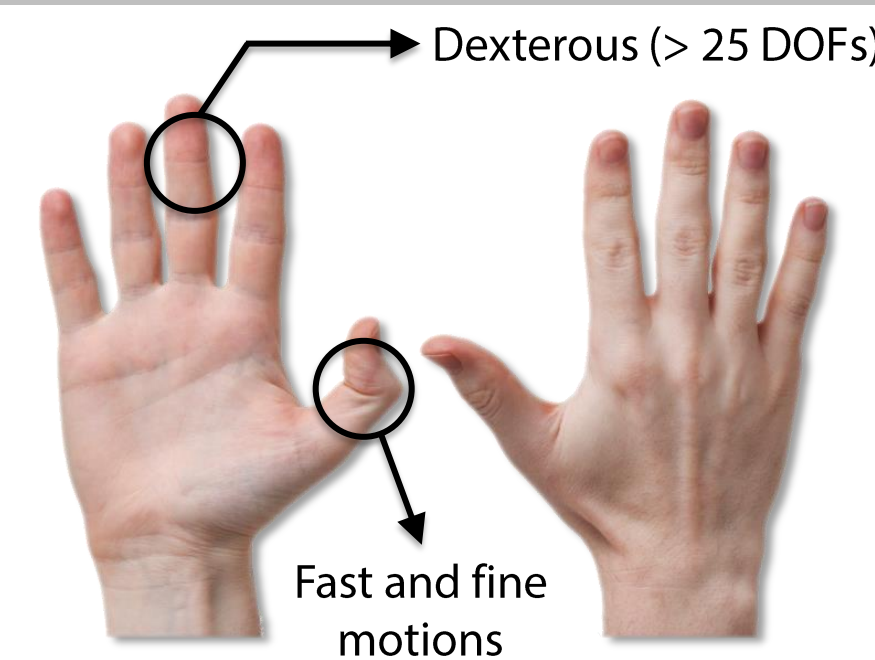
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Interaction with Future Devices



Impractical to use keyboard and mouse. Hands are **mobile, accessible** and always with us.

Hand Tracking

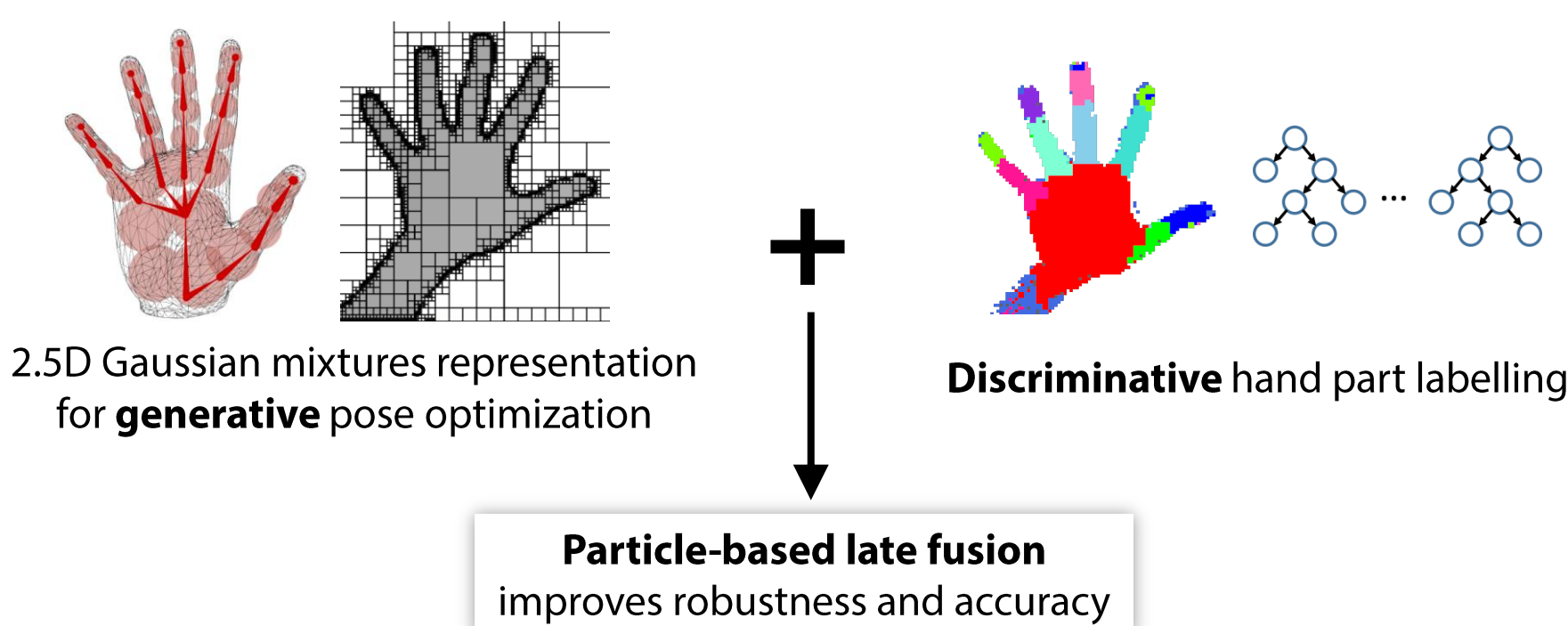


CHALLENGES

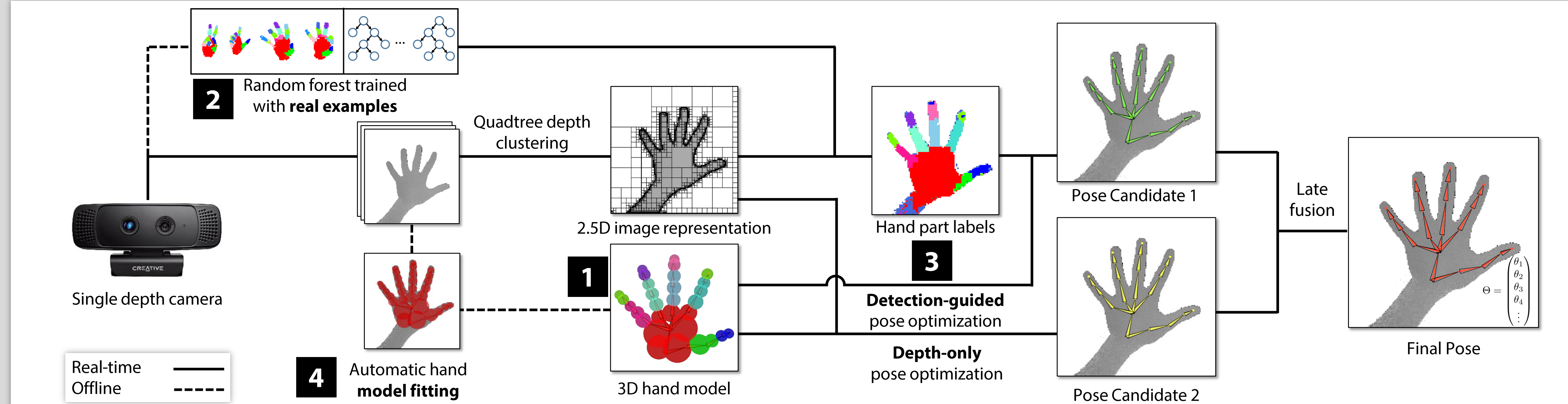
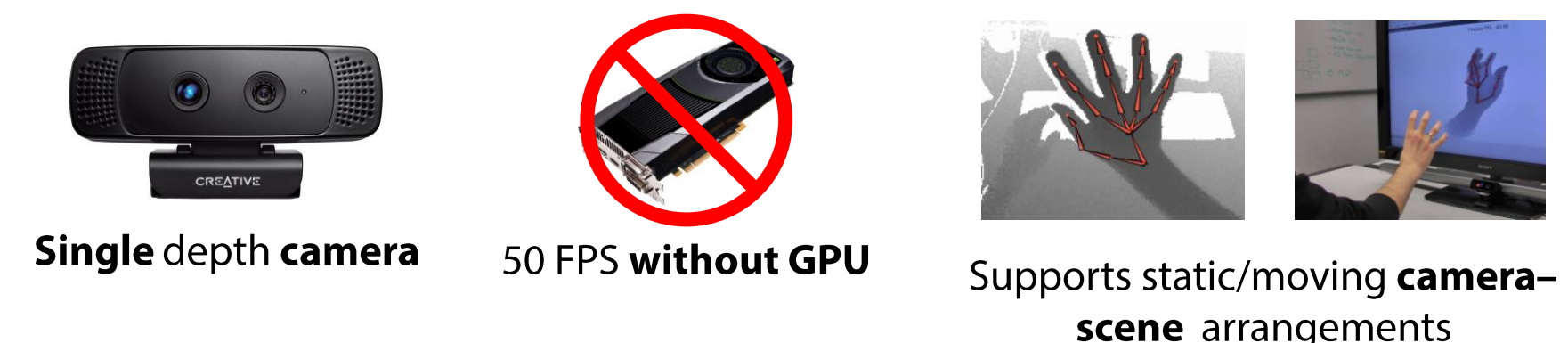
- **Complex** and fast motions
- **Uniform skin color**
- **Self occlusions**
- Varying **camera-scene** configurations
- **Real-time** pose optimization

Contributions

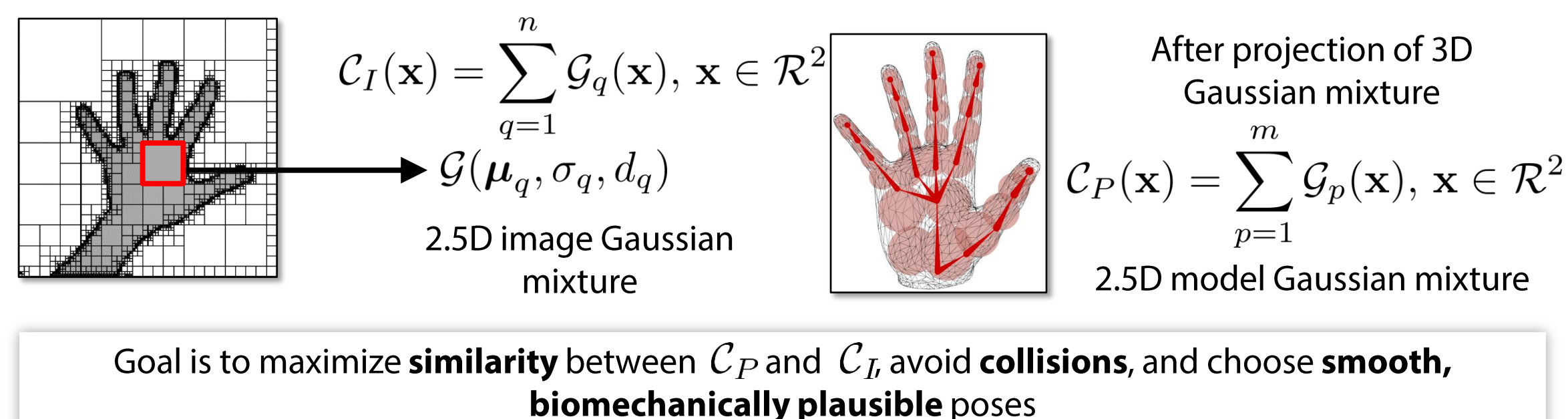
DETECTION-GUIDED POSE OPTIMIZATION



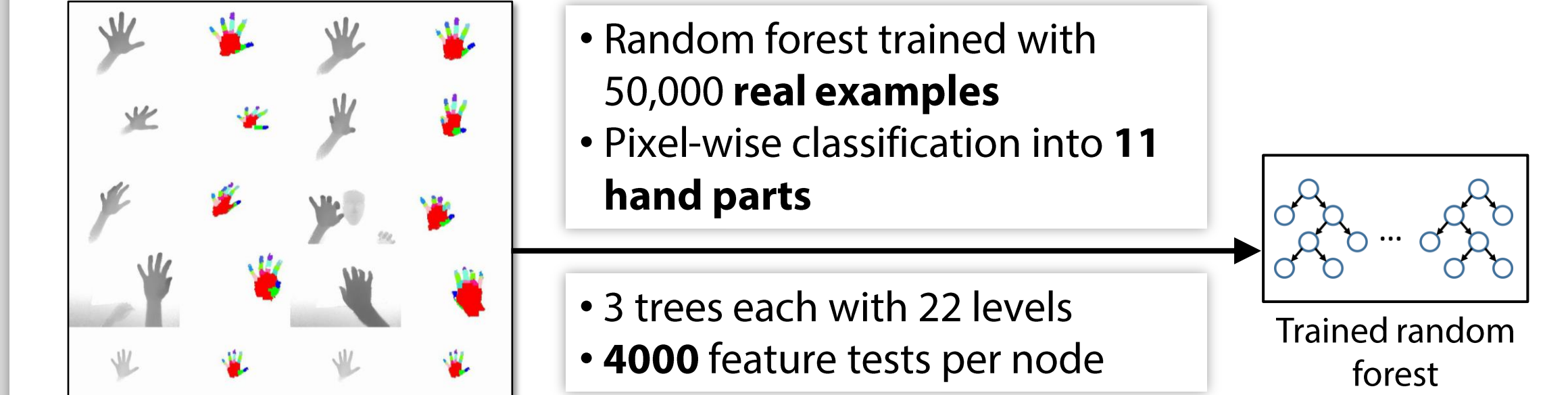
PRACTICAL



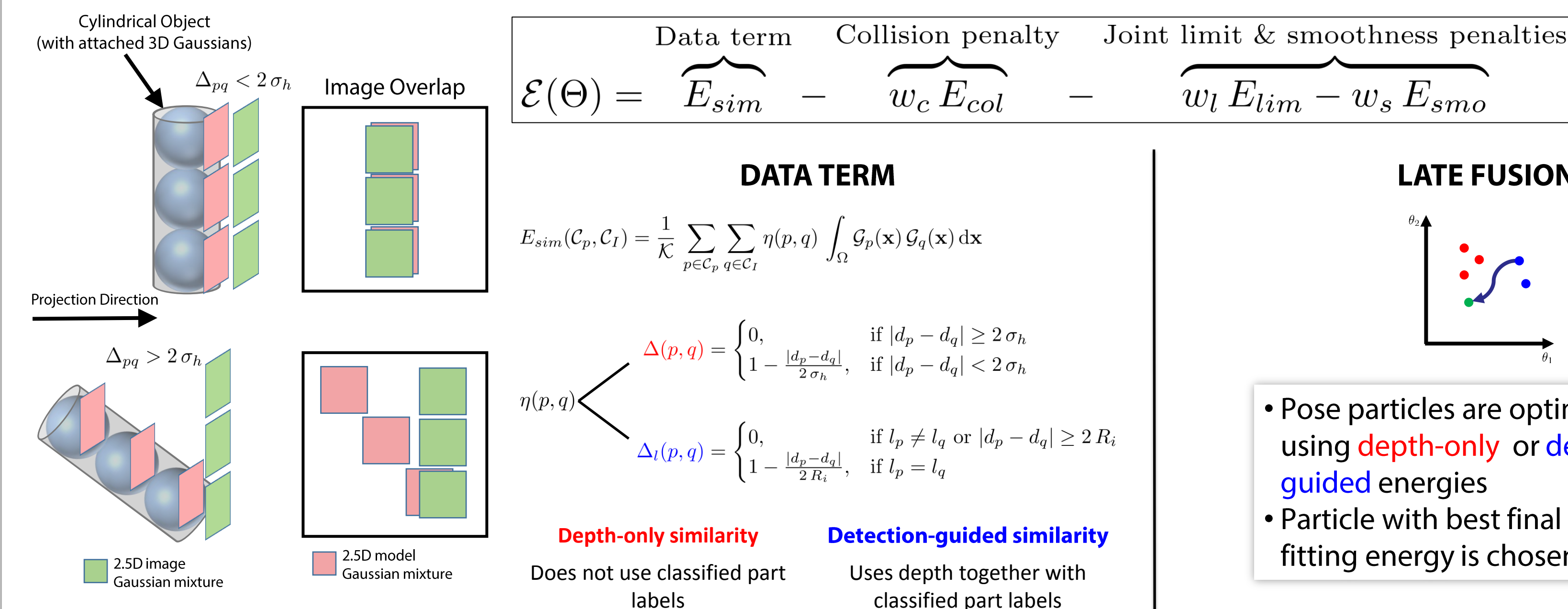
1 Input and Model Representation



2 Part Labelling Random Forest



3 Pose Optimization



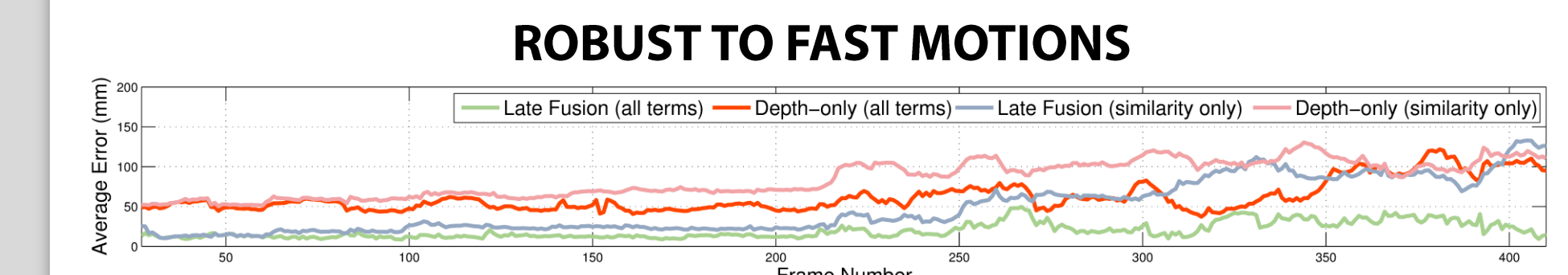
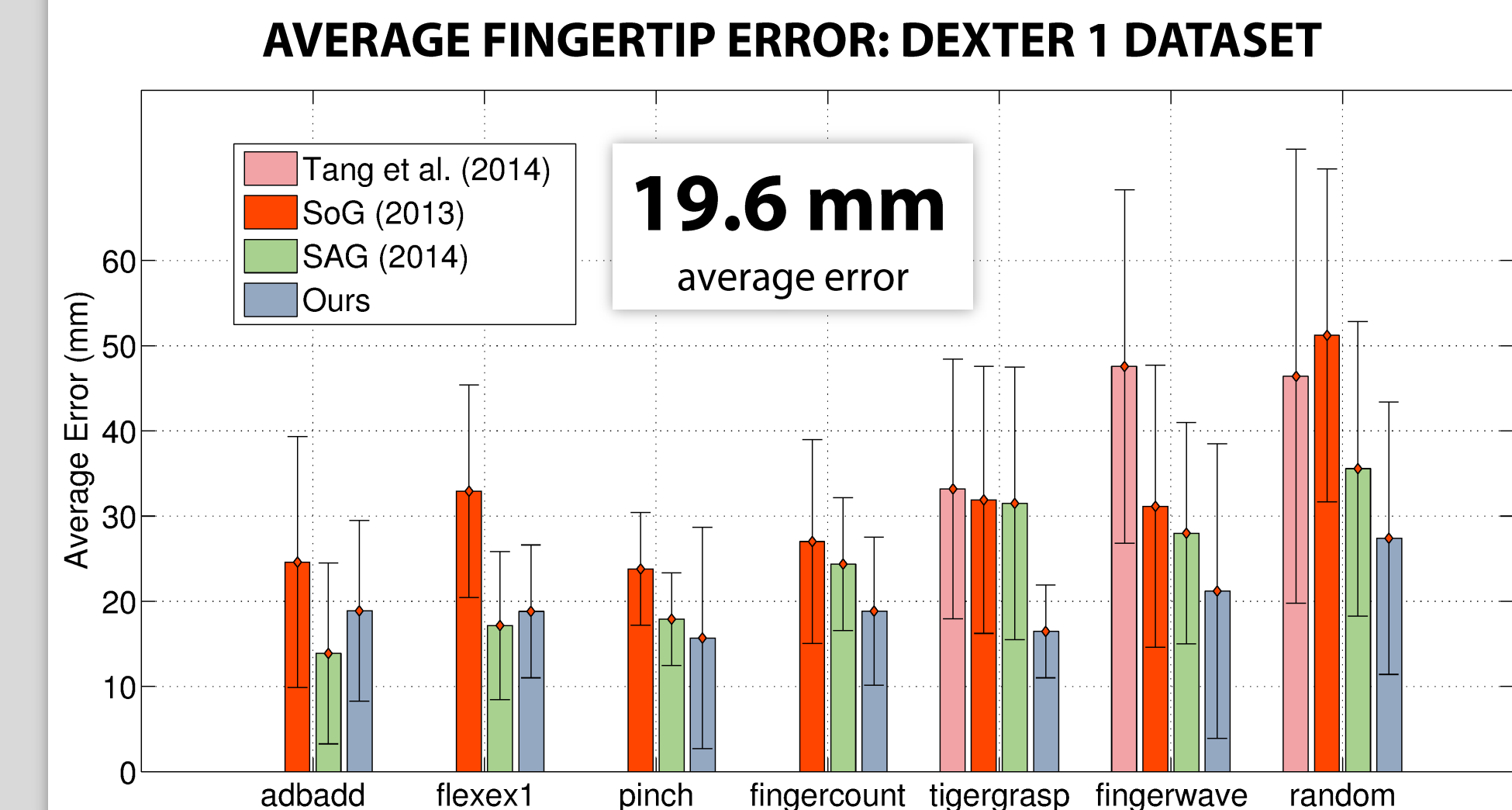
LATE FUSION

- Pose particles are optimized using **depth-only** or **detection-guided** energies
- Particle with best final pose fitting energy is chosen

4 Model Fitting



Results & Evaluation



QUALITATIVE TRACKING RESULTS

Tablet with video goes here

- **50 FPS** without GPU
- Different **camera-scene** settings
- Different **users**
- **Pinching** and **crossing** motions

Binaries available soon!**handtracker.mpi-inf.mpg.de**

Supported by the ERC Starting Grant projects CapReal (335545) and COMPUTED (637991), and the Academy of Finland. We would like to thank Christian Richardt.

For access to a wide range of human shape and performance capture datasets, please visit

gvvperfcapeva.mpi-inf.mpg.de