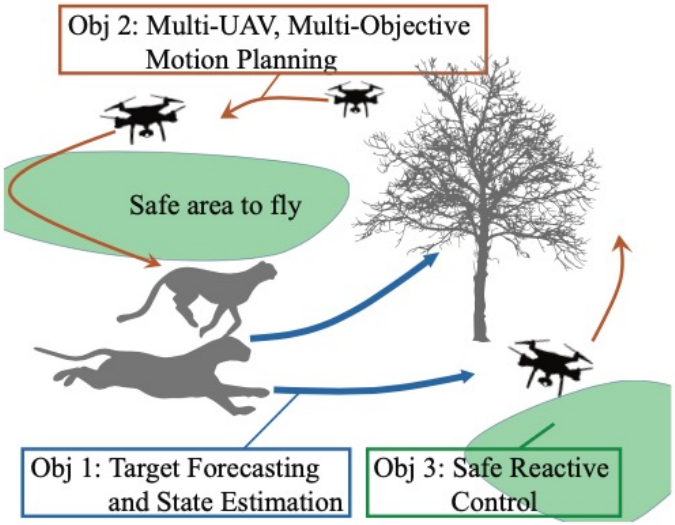
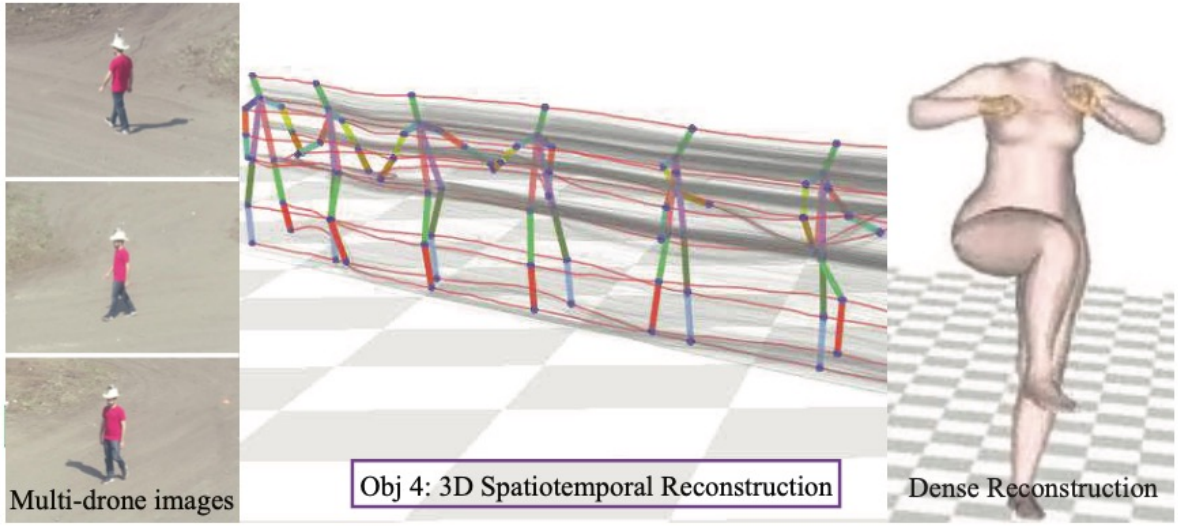
MultiFlyCam - Dense 3D Reconstruction of Dynamic Actors in Natural Environments using Multiple Flying Cameras

Key idea: Use team of flying cameras to rapidly reconstruct dense 3D models and motion





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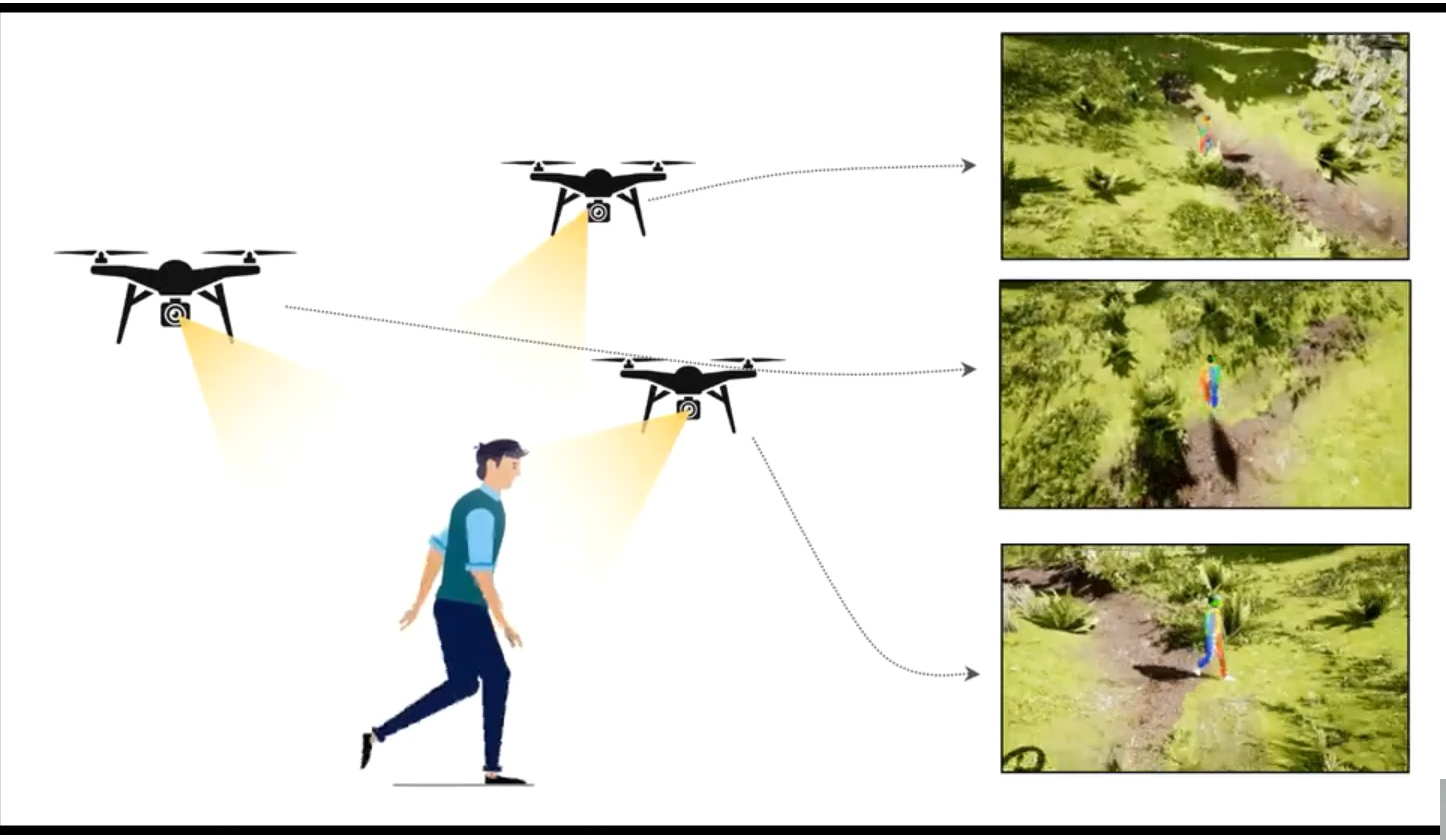
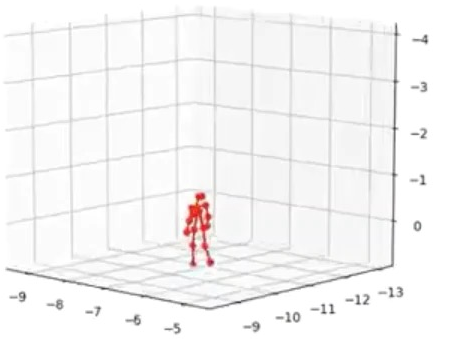
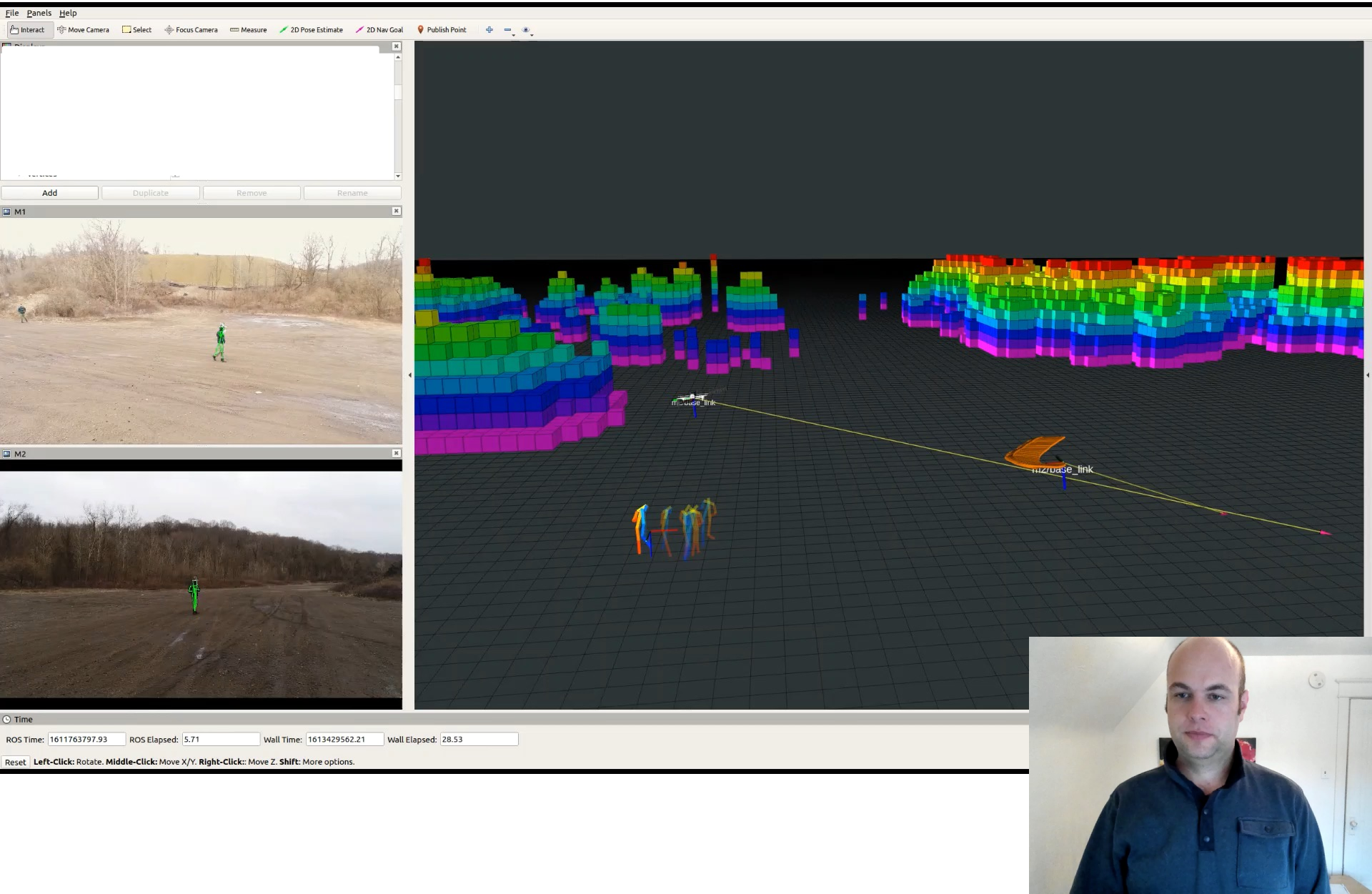
Collaborative Multi-Robot Formation Planning for 3D Human Pose Reconstruction



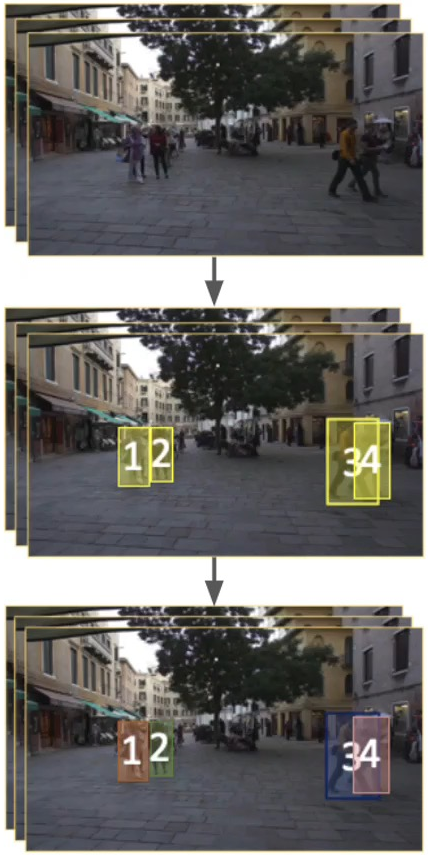


Collaborative Multi-Robot Formation Planning for 3D Human Pose Reconstruction



Multi-actor localization and tracking pipeline

Multi-actor localization by multiple flying cameras.

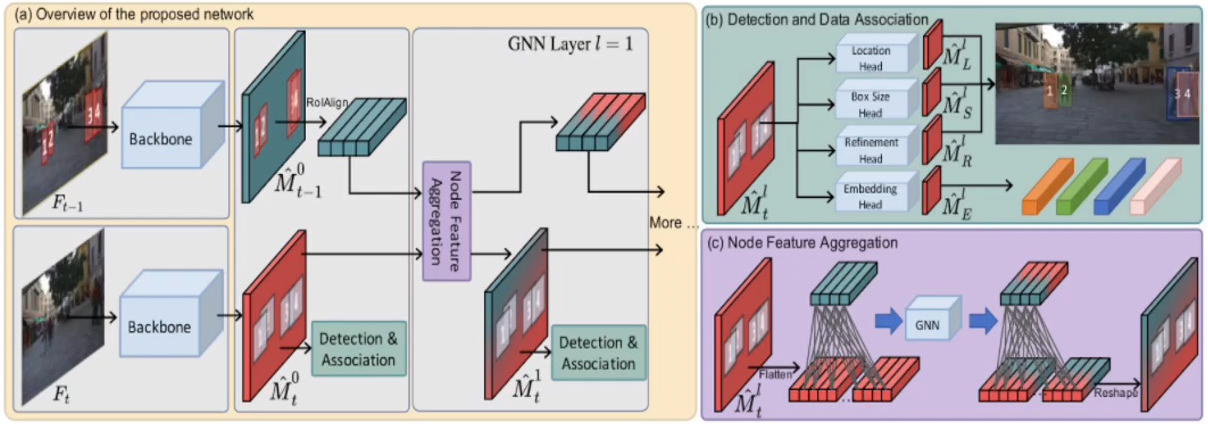


Input images

Actor detection

Actor tracking

Pipeline



- Approach
  - Feature extraction from two consecutive frames
  - Relation modeling between past tracklets and hypothesized objects in the current frame
  - Object detection via regressi
  - Matching between past track

RSN Lab - View planning on directional objects

Use a single drone to maintain frontal or complete coverage of mobile actors.

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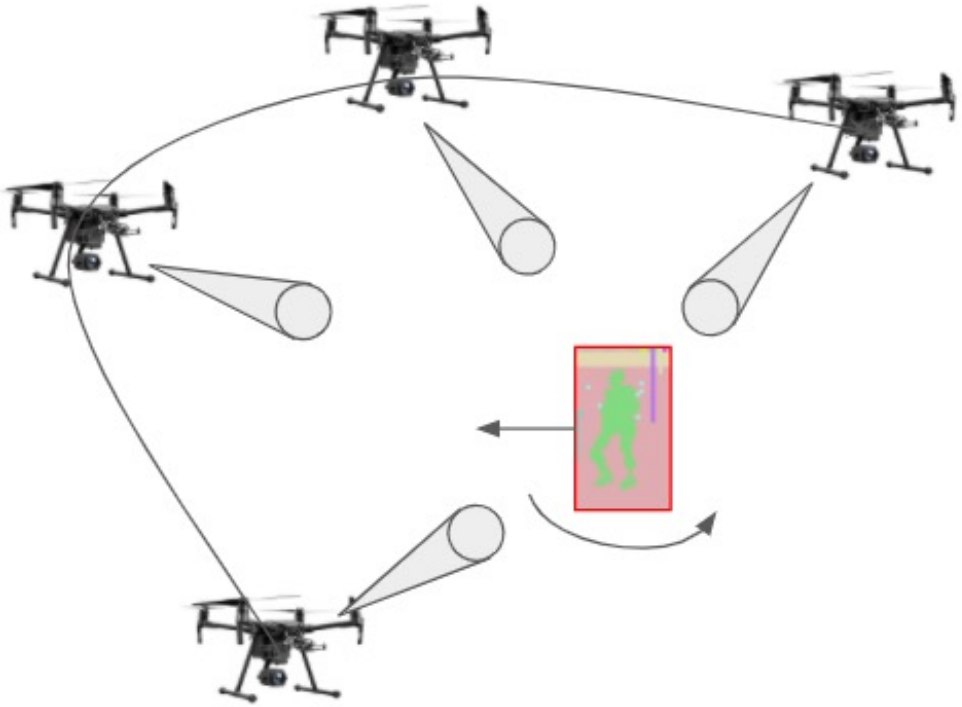
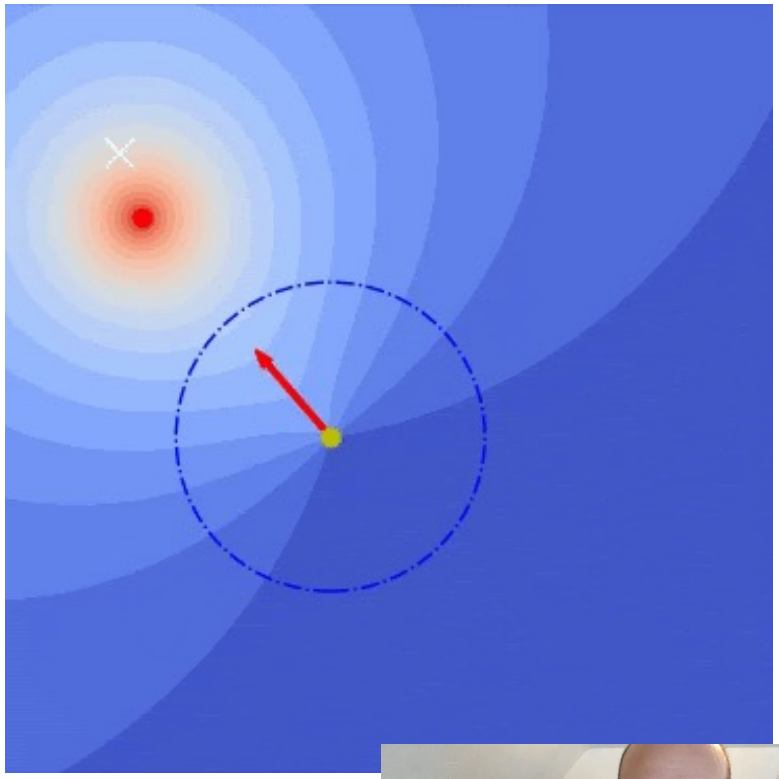
RSN Lab - View planning on directional objects

Current steps. Active tracking of an object with only yaw rotation in 2D space.



2D space planning given a single actor and view metric



2D planning p

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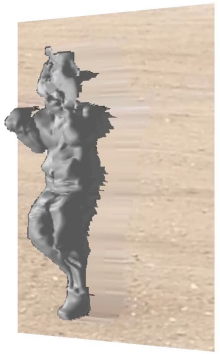
3D Reconstruction of Actors

Input Image

Output Depth

Output Normal

3D Surface

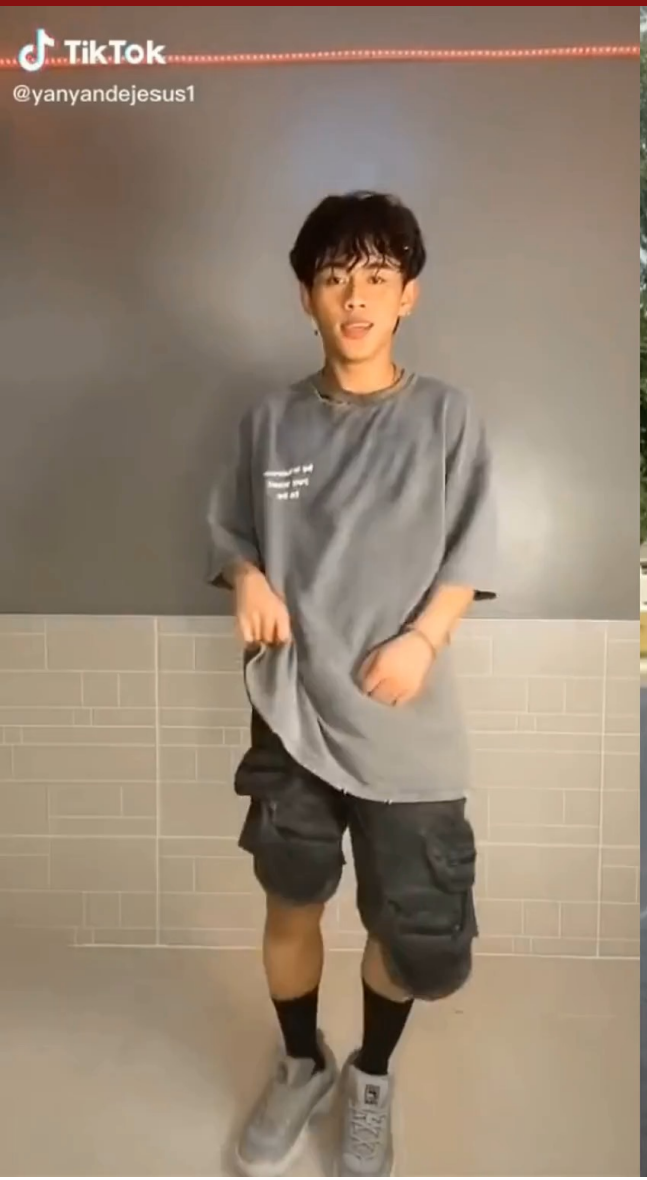


3D Surface side-view

3D Reconstruction of Actors

Scanned datasets. A few hundred 3D models.

3D Reconstruction of Actors



MultiFlyCam Impacts

Bio-mechanics of People

+ Animals

Dense 3D Reconstruction of Dynamic Actors

Cultural Preservation

Social Interactions

Principal Investigators and Organizations

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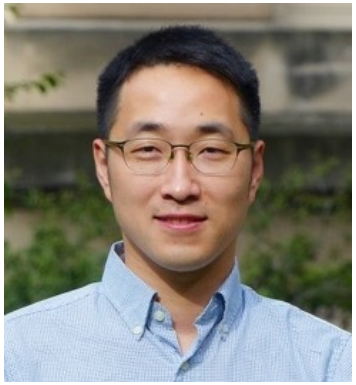

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