

Centre for Vision, Speech and Signal Processing



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BMVA



# 2D Or Not 2D: Bridging the Gap Between Tracking and Structure from Motion

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## MOTIVATION



Real-world sequences contain out-of-plane rotations.

Tracker often has to rapidly learn a change in appearance...

- But the object does not change!
- > Only the viewpoint has changed, why not model it explicitly?

### PRINCIPLE



given model and sequence, estimate camera pose

given sequence and cameras, compute features and model shape

given sequence and model, validate new features everything
estimated
simultaneously

#### ALGORITHM



#### OUTPUTS

- Shape model: what does the object look like?
  - comparable to the state-of-the-art
- > **3D trajectory**: what is the camera position?
  - 72 % better than VisualSFM
- > **2D trajectory/segmentation**: where is the object?
  - > 22/58 % better than the state-of-the-art





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