

Deformable 3-D Modelling from Uncalibrated Video Sequences

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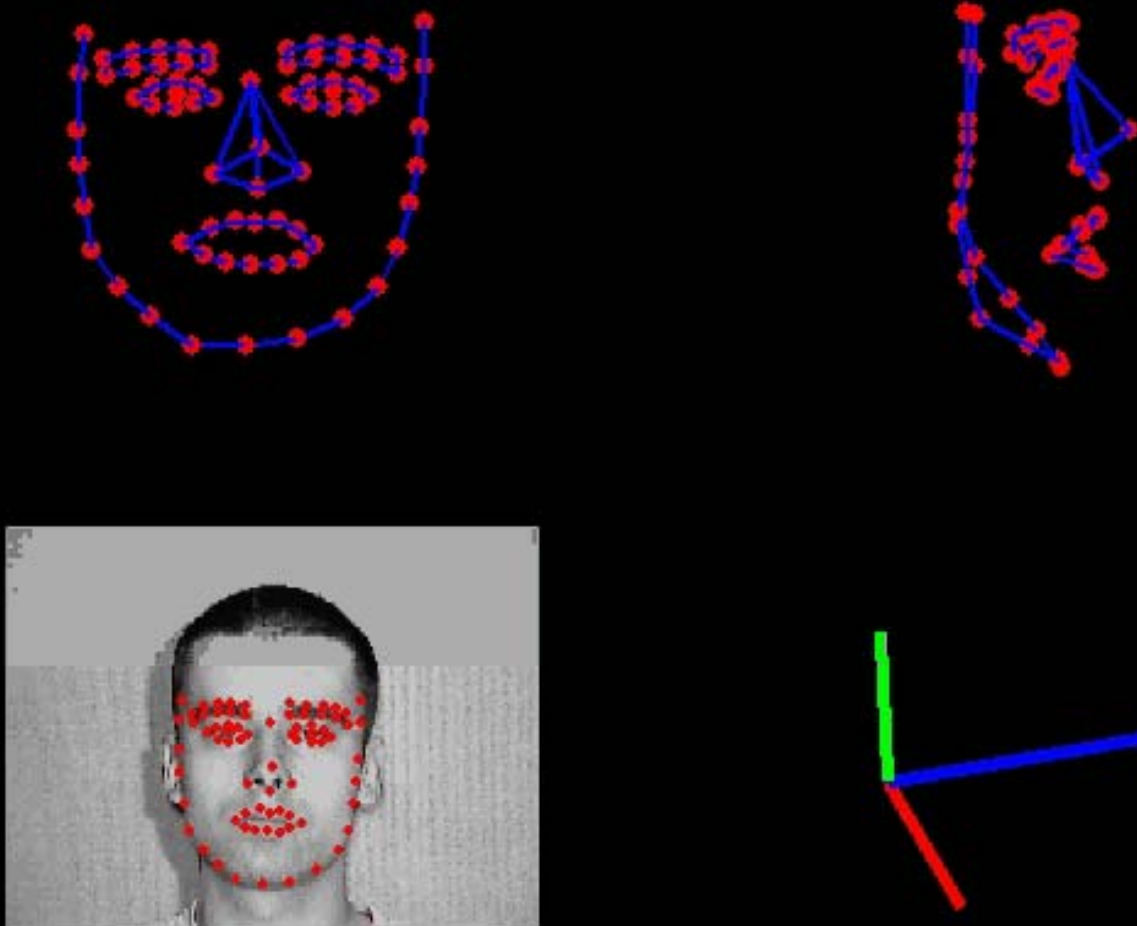
Queen Mary University of London

Video Contributions



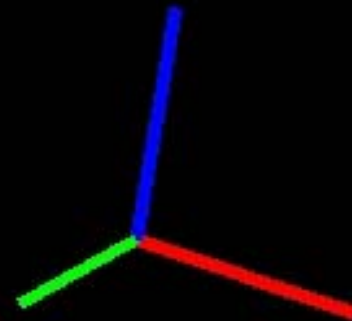
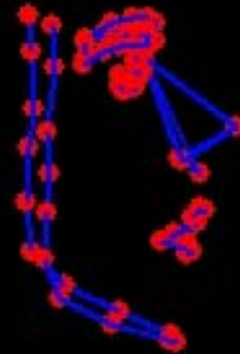
- Non-linear optimization scheme
- Stereo non-rigid factorization
- Non-rigid factorization with priors: orthographic cameras
- Non-rigid factorization: the projective case

Results – The Zalewski Sequence Before Bundle



lukas4_before_bundle.avi

Results – The Zalewski Sequence

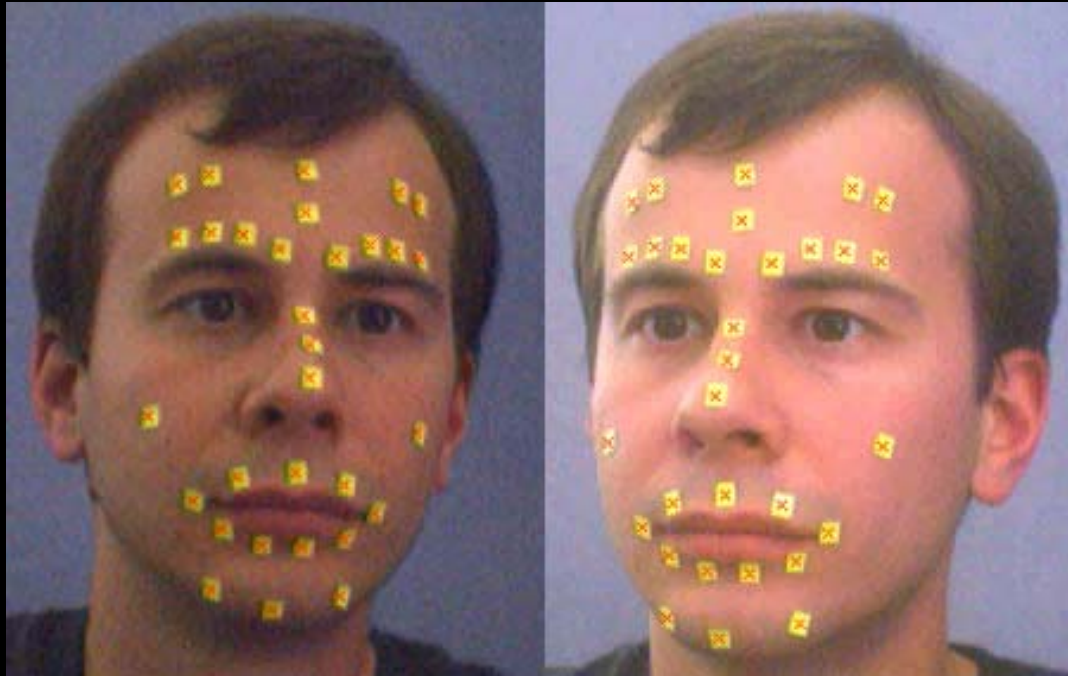


Video Contributions

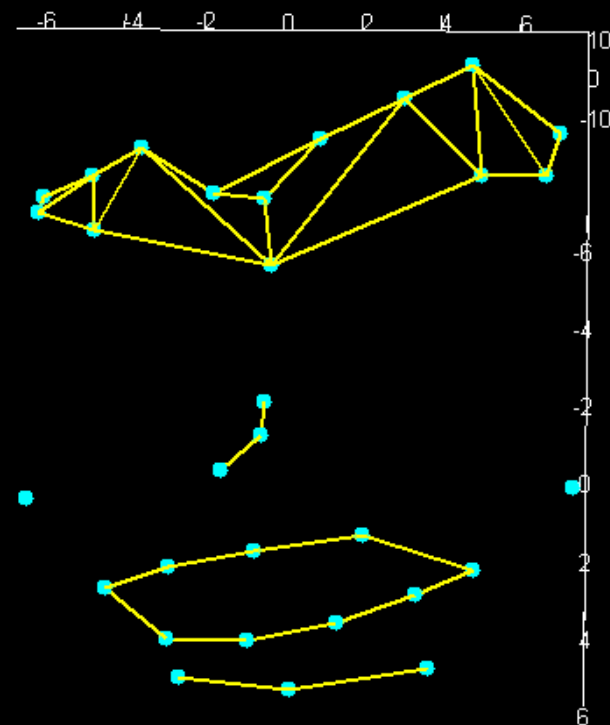
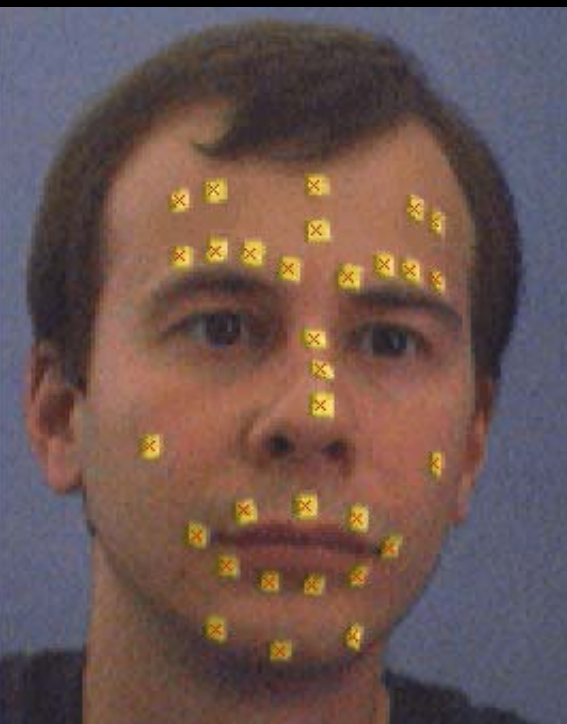


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- Non-rigid factorization: the projective case

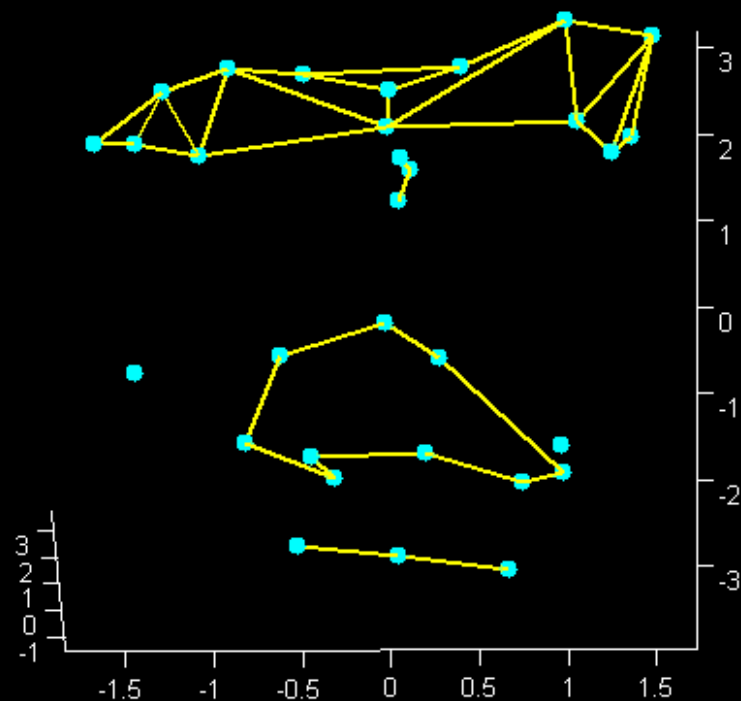
Stereo Tracking



stereo track markers.avi

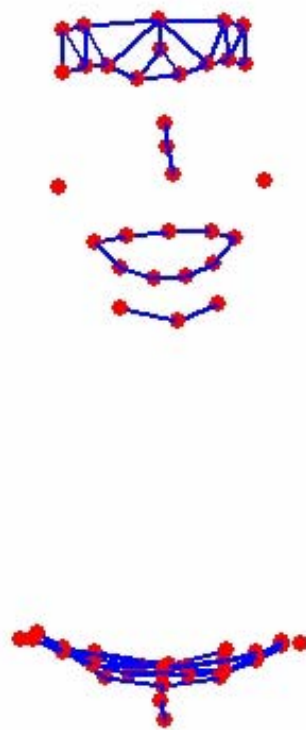


black right reconstruction eyebrows.avi



black left reconstruction eyebrows.avi

Results – SMILE sequence AFTER bundle adjustment



Video Contributions



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- Non-rigid factorization: the projective case

Real Experiments - Setup

- The subject is performing rigid motion, (mainly rotation) and a set of facial expressions.
- Ground truth is obtained from a motion capture system.

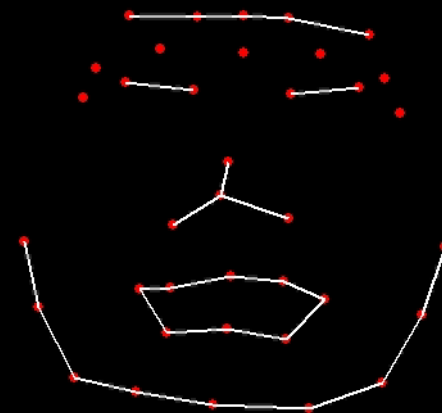
enrique.avi

Real Sequence

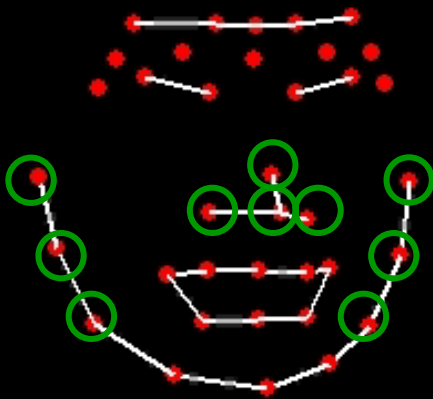


2D_projections.avi

2D Measurements



Real Experiments - Results



Front



Side



Top

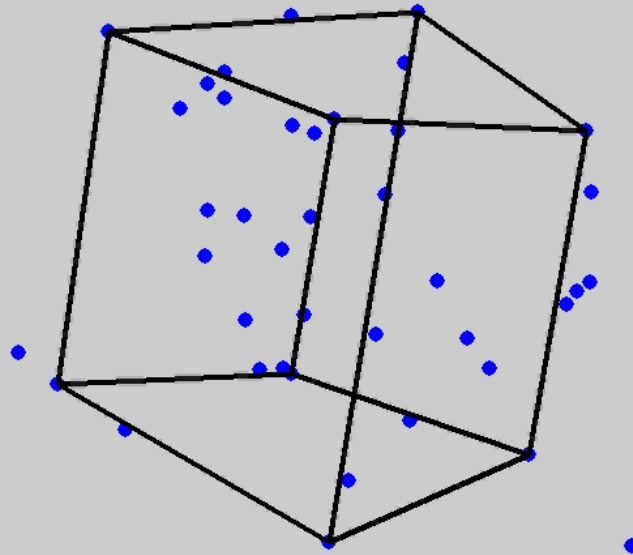
Video Contributions



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Synthetic Experiments

Examples of 2D views (camera setup 2)



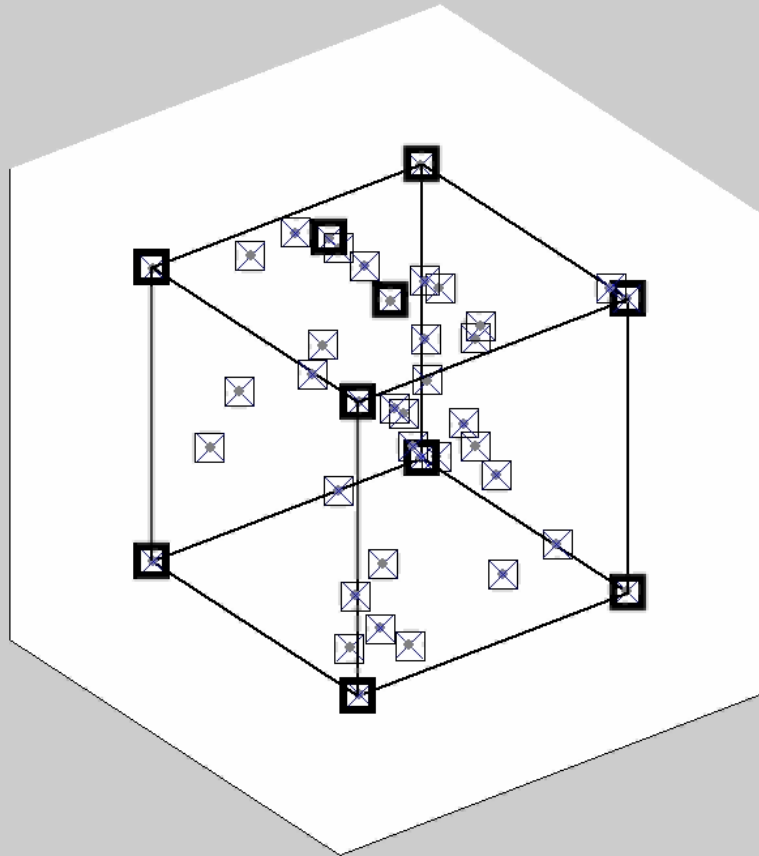
Setup 1: $d=150$, $f=800$

Setup 2: $d=100$, $f=500$

example_sequence2d.avi

Synthetic Experiments - Results

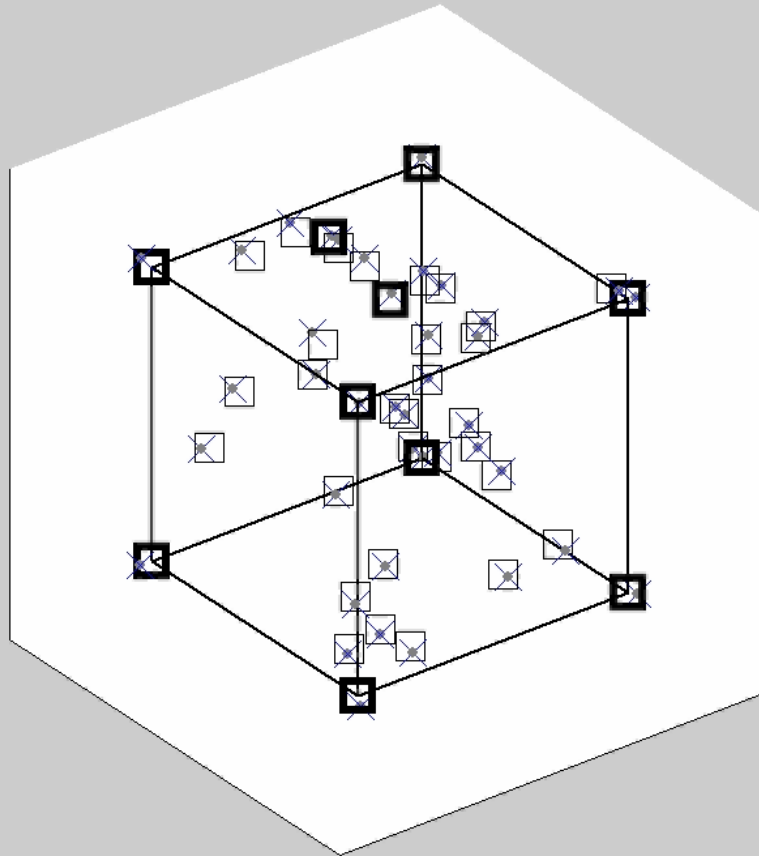
Noise=0. Ground truth (squares) vs reconstructed 3D points (x)



cube3D_noise0.avi

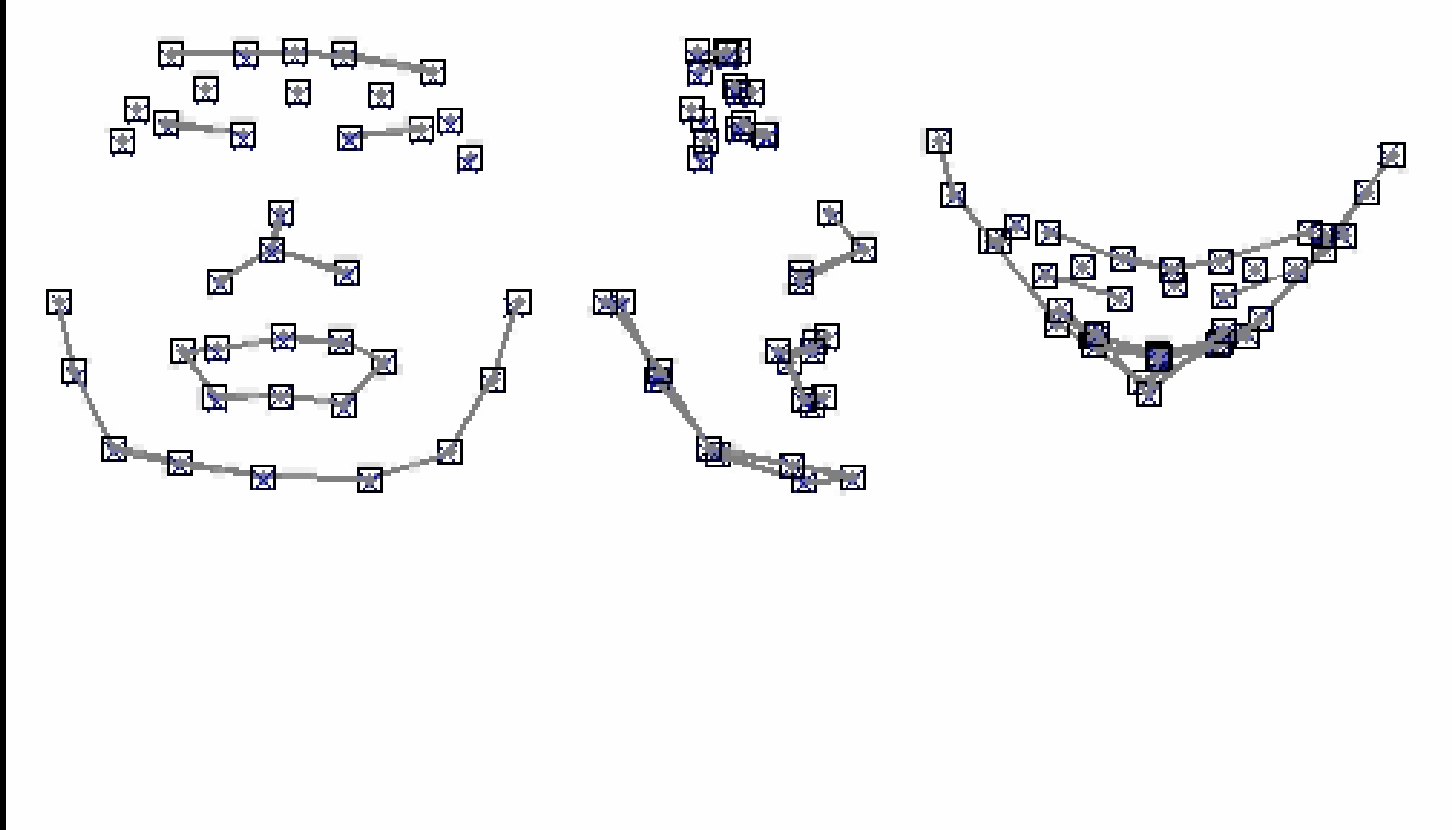
Synthetic Experiments - Results

Noise=2. Ground truth (squares) vs reconstructed 3D points (x)



cube3D_noise2.avi

Real Experiments - Results



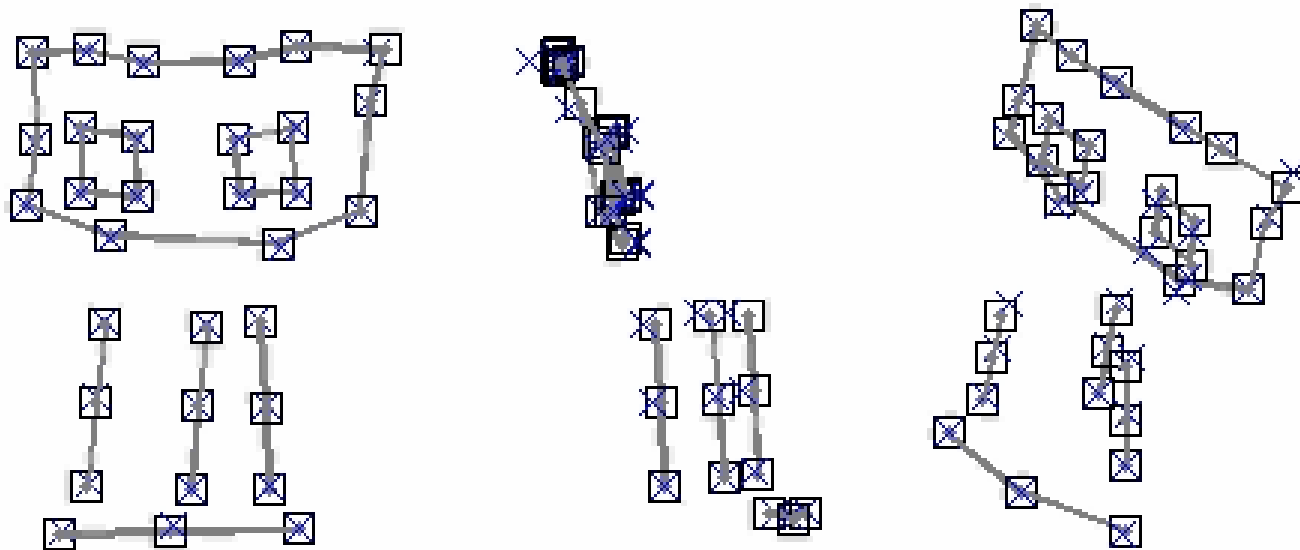
face_reconstruction.avi

Real Experiments - Results



pillow_real.avi

Real Experiments - Results



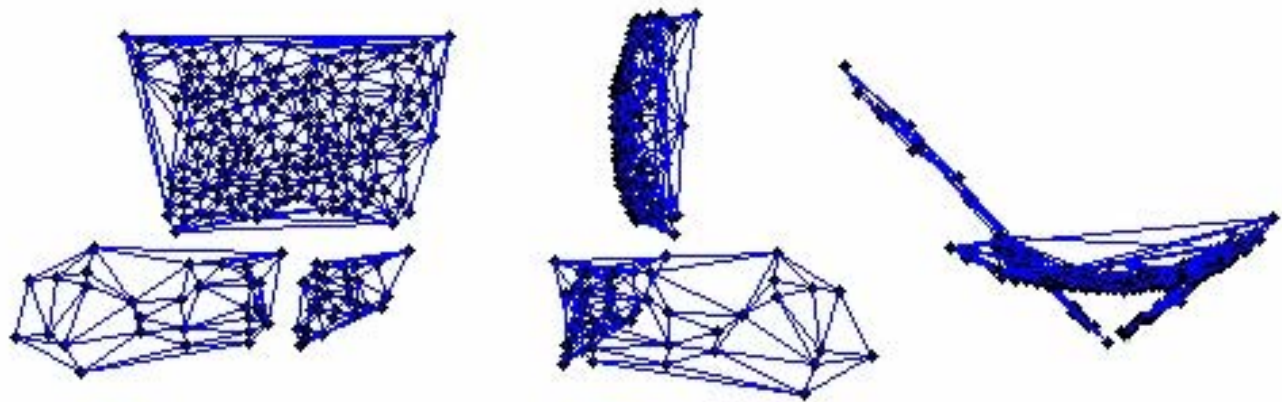
pillow_reconstruction_k6.avi

Real Experiments - Results



video box pillow long2.avi

Real Experiments - Results



box_cushion_video3d.avi