Numerical Analysis in Visual Computing:
not too little, not too much

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Abstract: Visual computing is a wide area that includes computer graphics and image processing, where the "eye-norm" rules.

I will briefly discuss two case studies involving numerical methods and analysis applied to this area. The first involves motion simulation and calibration of soft objects such as cloth, plants and skin. The governing elastodynamics PDE system, discretized in space already at the variational level using co-rotated FEM, leads to a large, expensive to assemble, dynamical system in time, where the damped motion may mask highly oscillatory stiffness. Geometric integration ideas are making their way into visual computing research these days in search for more quantitative computations.

The other case study involves some image processing problems where there is a premium for local approaches that do not necessarily use underlying PDEs. I will demonstrate and discuss.

The examples used are from several published or submitted papers.

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