

Numerical Methods in Visual Computing: what we can learn from each other

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Abstract: Visual computing is a wide area that includes computer graphics and image processing, where the “eyeball-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 plants, skin, and cloth. 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. An exponential differencing method will be described, 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.

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