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85209. *Computations on Parametrized Surfaces with Chebfun2.*

Chebfun is a collection of algorithms and an open-source software system in object-oriented MATLAB that extends familiar powerful methods of numerical computation involving numbers to continuous or piecewise-continuous functions. The success of this strategy is based on the mathematical fact that smooth functions can be represented very efficiently by polynomial interpolation at Chebyshev points. More recently, the system has been extended to handle bivariate functions and vector fields. These two new classes of objects are called Chebfun2 and Chebfun2v respectively. In this talk, we show that Chebfun2 and Chebfun2v can be used to accurately and efficiently perform various computations on parametric surfaces in two or three dimensions, including path trajectories and mean and Gaussian curvatures. More advanced surface computations such as mean curvature flows are also explored. (Received September 17, 2013)