MATEMATISKA INSTITUTIONEN
STOCKHOLMS UNIVERSITET
Avd. Matematik

SJÄLVSTÄNDIGT ARBETE I MATEMATIK

Måndagen den 27 januarui kl. 13.00–14.00 presenterar Niklas Hedberg sitt arbete "Derivation of Runge-Kutta order conditions" (15 högskolepoäng, grundnivå).

Handledare: Ivan Martino

Plats: Sal 31, hus 5, Kräftriket

Sammanfattning: In the field of numerical analysis to solve Ordinary Differential Equations (ODEs), Runge-Kutta (RK) methods take a sequence of first order approximations of the ODE and weights them in a linear combination for each time step. Given existence and uniqueness criteria, the numerical solution can therefore approximate the theoretical solution to a great deal of accuracy. The point of interest when constructing these methods is thus to ensure convergence. In order to do this, one compares the Taylor expansions of the truess-olution with that of the numerical. One matches the two up to and including the order of a particular derivative, we gain a RK method of that order. The strive for higher orders makes this matching difficult, and this paper concerns the derivation of the conditions required to construct a method of a certain order. This is done by connecting the Taylor expansions with rooted trees.VE is proposed.

Alla intresserade är välkomna!