Dual subdivision and interpolation

Lucia Romani
Dept. of Mathematics, Alma Mater Studiorum Università di Bologna, Italy
lucia.romani@unibo.it

Subdivision schemes are well-established tools for the construction of curves and surfaces. Given an initial set of points attached to an initial grid, a subdivision scheme recursively refines the current grid and computes new data to be attached to it, in order to obtain a smooth limit. This talk concerns dual subdivision schemes working on one-dimensional grids and investigates their capability of generating limit curves that interpolate the initial data. Recalling the results in [2], we first show that, differently from primal schemes, their dual counterparts do not satisfy the step-wise interpolation property and are not defined via refinement rules that at each stage of the iteration leave the previous set of points unchanged. Then, after reviewing the work completed in [3], we prove that a whole family of dual interpolating schemes of arity larger than 2 can indeed be constructed and, as recently discussed in [1], its construction can be conveniently reduced to the solution of a certain Bézout-like polynomial equation. Moreover, under some suitable assumptions, it is also possible to study a priori the existence of a dual interpolating scheme of a certain arity, that fulfills specific requests about polynomial reproduction, support size and regularity.

Joint work with: Luca Gemignani (Università di Pisa), Alberto Viscardi (Università di Torino).

References

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