

# Merrien-type ternary Hermite subdivision schemes with high regularity

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## Abstract

In this talk we discuss a strategy for the definition of a ternary interpolatory Hermite subdivision scheme of small support and high smoothness. As expected, leaving the binary domain, it is indeed possible to get ternary interpolatory Hermite subdivision schemes with higher regularity than their binary counterpart. The scheme we construct is a 3-point ternary interpolatory Hermite schemes with two free parameters. Even if it deals with function and derivatives only, it is proven to be  $\mathcal{HC}^2$ -smooth whenever the parameters are taken in a polygonal region of the plane. To get it, we first reinterpret the ternary interpolatory scalar 3-point subdivision scheme given by [1] in a geometric way. Then, we extend the geometric construction to the Hermite situation. The regularity of the (vector) limit function is proved with the help of a joint spectral radius approach based on [2].

## References

- [1] M. F. Hassan and N. A. Dodgson, Ternary and three-point univariate subdivision schemes, *Curve and Surface Fitting: Saint-Malo 2002* (A. Cohen, J.-L. Merrien, and L. L. Schumaker, eds.), Nashboro Press, 2003, pp. 199-208
- [2] T. Mejsrik, Improved invariant polytope algorithm and applications, submitted, II revision.