

ON REPRESENTATION OF DERIVATIVES USING GENERALIZED KANTOROVICH SAMPLING OPERATORS

OLGA GRAF AND GERT TAMBERG

In this talk we consider representation of derivatives using generalized Kantorovich sampling operators, introduced in [OT]. We consider also a construction of fractional derivative masks for image edge detection and enhancement, based on generalized Kantorovich sampling operators. Edge detection and image enhancement methods, based on derivatives are well-known. Recently there is development to use several generalized fractional derivatives instead of the classical derivatives of order 1 and 2 (see [YCZ] and references cited there). Generalized sampling operators are a natural way to represent images. Such representation gives us a possibility to define different derivative masks. In fact, if the kernel is Hann kernel, we get the Sobel masks. Taking into account how well the generalized sampling operators allow to construct classical derivative masks, we use them also for fractional derivatives. We use generalized Kantorovich sampling operators, for more flexibility of the construction of masks.

REFERENCES

[OT] Orlova, O., Tamberg, G: On approximation properties of generalized Kantorovich-type sampling operators. *Journal of Approximation Theory* **201**, 3–86 (2016)

[YCZ] Yang, Q., Chen, D., Zhao, T. et al. Fractional calculus in image processing: a review. *Fractional Calculus and Applied Analysis* **19** 1222–1249 (2016)

DIVISION OF MATHEMATICS, DEPARTMENT OF CYBERNETICS, TALLINN UNIVERSITY OF TECHNOLOGY, EHITAJATE TEE 5, 19086 TALLINN, ESTONIA

Email address: `olga.a.graf@gmail.com`, `gert.tamberg@taltech.ee`