

Polynomial approximation of functions with singular points

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The polynomial approximation of non-continuous or non- L^p -integrable functions occurs in several contexts. In many applications, functions may have a finite number of strong singularities at the endpoints of the interval of definition and/or at some inner points.

A frequently used procedure consists of multiplying the function f by a suitable weight u so that fu turns out to be continuous or belongs to L^p ; then fu can be approximated by a sequence of the form $\{P_m u\}$, where P_m is a polynomial of degree m . The choice of the weight u is related to the “pathology” of the function f (see [2, 1]).

In this talk we are going to show the main results in the case of singularities at the endpoints of the interval and we will mention the case of inner singularities. The behaviour of some concrete approximation operators will be also illustrated.

References

- [1] M. C. De Bonis, G. Mastroianni and I. Notarangelo, *Elementi di Teoria dell'Approssimazione Polinomiale*, Mathematical and Computational Biology and Numerical Analysis n. 3, Aracne, 2018. ISBN: 978-88-255-1177-2
- [2] G. Mastroianni and G. V. Milovanović *Interpolation Processes. Basic Theory and Applications*, Springer Monographs in Mathematics, Springer-Verlag, Berlin, 2008. ISBN: 978-3-540-68346-9