



A strong inverse theorem for Bernstein operators in weighted spaces[†]

Jorge Bustamante and Miriam Cisneros-Martínez

Abstract

We present strong converse inequalities for approximation by Bernstein polynomials in some weighted spaces of $C[0, 1]$.

Keywords: Bernstein polynomials, inverse theorems, weighted spaces.

MSC: 41A10, 41A17, 41A27, 41A36.

§1. Introduction

Let $C[0, 1]$ ($C^r[0, 1]$) be the space of all real continuous (r -times continuously differentiable) functions on $[0, 1]$ and denote $\varphi(x) = \sqrt{x(1-x)}$, $x \in [0, 1]$.

Throughout the paper $\varrho \in C[0, 1]$ is a nonnegative concave function which is positive on $(0, 1)$

Let $C_\varrho[0, 1]$ be the Banach space of all $f \in C[0, 1]$ such that

$$\|f\|_\varrho = \sup_{x \in (0,1)} \frac{|f(x)|}{\varrho(x)} < \infty$$

and $C_\varrho^2[0, 1]$ the set of all $g \in C_\varrho[0, 1]$ such that $g \in C^2[0, 1]$ and $\|\varphi^2 g''\|_\varrho < \infty$. We also denote by $D_\varrho[0, 1]$ the closure of $C_\varrho^2[0, 1]$ in $C_\varrho[0, 1]$ (in the $C_\varrho[0, 1]$ norm).

[†]Partially supported by Research Project DGA (E-64), MTM2015-67006-P.

Communicated by

D. Leviatan

Received

February 8, 2016

Accepted

March 8, 2016