Karátson, J.

Gradient method in Sobolev spaces for nonlocal boundary-value problems. (English)

Zbl 0995.35020
Electron. J. Differ. Equ. 2000, Paper No. 51, 17 p. (2000).

Summary: An infinite-dimensional gradient method is proposed for the numerical solution of nonlocal quasilinear boundary value problems. The iteration is executed for the boundary value problem itself (i.e. on the continuous level) in the corresponding Sobolev space, reducing the nonlinear boundary-value problem to auxiliary linear problems. We extend earlier results concerning local (Dirichlet) boundary value problems. We show linear convergence of our method, and present a numerical example.

MSC:

35J65 Nonlinear boundary value problems for linear elliptic equations
46N20 Applications of functional analysis to differential and integral equations
46E35 Sobolev spaces and other spaces of "smooth" functions, embedding theorems, trace theorems
90C99 Mathematical programming

Keywords:

infinite-dimensional gradient method; linear convergence

Software:

KELLEY

Full Text: EuDML EMIS