Boundary Value Problems
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Nonlocal boundary value problems

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In the last decades, nonlocal boundary value problems have become a rapidly growing area of research. The study of this type of problems is driven not only by a theoretical interest, but also by the fact that several phenomena in engineering, physics and life sciences can be modelled in this way. For example, problems with feedback controls such as the steady-states of a thermostat, where a controller at one of its ends adds or removes heat, depending upon the temperature registered in another point, can be interpreted with a second-order ordinary differential equation subject to a three-point boundary condition.

This volume contains a variety of contributions within this area of research. The first article, by Alberto Cabada, is an invited review on the applications of the method of upper and lower solutions to boundary value problems with nonlinear boundary data. The following articles deal with boundary value problems with nonlocal conditions for ordinary, discrete, impulsive, neutral, parabolic, fractional and time scales equations. The last two papers deal with problems where the nonlocality occurs in the equation, rather than in the boundary conditions.

In the contributions, existence, nonexistence, multiplicity, asymptotic behavior, and approx-imation of solutions are considered by using several methods as fixed point theorems, fixed point index, variational methods, iterative techniques, bifurcation theory, and lower and upper solutions.

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