INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student	:	RESHMI BISWAS
Roll Number	:	156123025
Programme of Study	:	Ph.D.

Thesis Title: Study of non-local elliptic problems involving variable order and variable exponents

Name of Thesis Supervisor(s)	:	Dr. Sweta Tiwari
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SHORT ABSTRACT

Short Abstract of the Thesis is checked for correctness. Recommended for submission.

In the thesis, we study some non-local and nonlinear elliptic equations involving variable order and variable exponents. For studying these problems, we introduce the variable order fractional Sobolev spaces with variable exponents and explore basic properties of these spaces. Then we study the existence/multiplicity of weak solutions of a class of elliptic equations involving the nonlocal operator with variable order and variable exponents and generalized Choquard type (also called Hartree type) non-linearity. For that, first we establish a Hardy-Sobolev-Littlewood-type inequality result suitable for the fractional framework involving variable exponents. Using Nehari manifold and fibering map, we further discuss the existence of the ground state solution of a Kirchhoff-Choquard problem involving the same operator and the reaction term without satisfying the well-known Ambrosetti-Rabinowitz type condition. In addition, we study existence of infinitely many solutions of this problem using Fountain theorem and Dual fountain theorem via Cerami condition and Cerami* condition, respectively. Next, we study the regularity results for a class of doubly non-local equations involving fractional p-Laplacian and critical Choquard type nonlinearity in the sense of Hardy-Littlewood-Sobolev inequality. Finally, using Nehari manifold method and fibering map analysis, we investigate multiplicity result for the nonlocal elliptic system involving variable exponents and concave-convex nonlinearities.

Tiwari
25/02/2021.

Signature of Thesis Supervisor(s) with Date