ABSTRACT

In this thesis, the author has introduced and studied the concepts of vague fuzzy digital structure spaces, vague fuzzy digital bi-structure spaces, pairwise vague fuzzy digital structure $K$-connected spaces, pairwise vague fuzzy digital structure $K$-extremally disconnected spaces, pairwise vague fuzzy digital structure $K$-Hausdorff spaces, pairwise vague fuzzy digital structure $K$-compact spaces, vague fuzzy digital structure homotopy, vague fuzzy digital structure contractible spaces, vague fuzzy digital structure cofibration, intuitionistic fuzzy $G_{\delta}^{\alpha}$-locally closed sets, intuitionistic fuzzy $G_{\delta}^{\alpha}$-locally continuous functions, intuitionistic fuzzy $G_{\delta}^{\alpha}$-locally homeomorphisms, intuitionistic fuzzy $G_{\delta}^{\alpha}$-local $T_{1/2}$ (resp., $S$, pre, $\alpha$, $\beta$) spaces, intuitionistic fuzzy $G_{\delta}^{\alpha}$-locally compact spaces, intuitionistic fuzzy $G_{\delta}^{\alpha}$-local Uryshon spaces, intuitionistic fuzzy $G_{\delta}^{\alpha}$-local connected spaces, intuitionistic fuzzy $G_{\delta}^{\alpha}$-local compact spaces, intuitionistic fuzzy $T^{c}$ prefilter, intuitionistic fuzzy normal family, intuitionistic fuzzy $F^{*}$ spaces, intuitionistic fuzzy $C^{\mathcal{C}}$ compactification, intuitionistic fuzzy structure ring spaces, intuitionistic fuzzy ring exterior $B$ spaces, intuitionistic fuzzy ring exterior $V$ spaces, intuitionistic fuzzy ring basic compact spaces and intuitionistic fuzzy ring extremal compact spaces. Some interesting properties, characterizations and interrelations among the concepts are established. Also, counter examples are provided wherever necessary in the thesis.