**LIST OF SYMBOLS**

- $(X, N, *)$ - Fuzzy Banach Space
- $(G, \circ)$ - Group of paths
- $(G', \circ)$ - Group of fuzzy paths
- $(\mathcal{G}, \circ)$ - Group of transition maps
- $(\mathcal{M}, \sim, (G, \circ)) = N_1$ - Network structure of first kind
- $(\mathcal{M}, \sim, (G', \circ)) = N_2$ - Network structure of second kind
- $(\mathcal{M}, (\mathcal{G}, \circ))$ - Smooth fuzzy Banach manifold
- $(\mathcal{M}, (G', \circ), (\mathcal{G}, \circ)) = \mathcal{N}$ - Network fuzzy Banach manifold
- $\pi_1((\mathcal{M}, \tau), x_\lambda)$ - is set of all equivalence classes of fuzzy smooth homotopy loops
- $(\mathcal{M}, \simeq, \pi_1((M, \tau), x_\lambda)) = N_3$ - Network structure of third kind