

On the category of probabilistic topological convergence groups

T. M. G. Ahsanullah

tmga1@ksu.edu.sa

Generalizing the idea of Lowen – approach spaces [4], Jäger introduced the notion of probabilistic approach spaces [3]. Ahsanullah and Jäger presented a category of probabilistic convergence groups, studied uniformizability and metrization of probabilistic convergence groups, exploring some natural connections between the categories of probabilistic metric groups and probabilistic convergence groups [1, 2]. In this talk, we first show that the category of probabilistic topological convergence groups is *isomorphic* to the category of probabilistic approach groups under so-called triangle function $\tau: \Delta^+ \times \Delta^+ \rightarrow \Delta^+$, where Δ^+ is the set of all *distance distribution functions* that plays a central role for probabilistic metric spaces. Furthermore, if we allow this triangle function τ to be *sup-continuous*, then among others, one can show that the category of symmetric probabilistic quasi-metric groups can be embedded into the category of probabilistic approach groups as a bireflective subcategory. Finally, we discuss the relationship between the categories of probabilistic topological convergence transformation groups and probabilistic approach transformation groups under the triangle function τ .

- [1] T. M. G. AHSANULLAH AND G. JÄGER, *Probabilistic uniformization and probabilistic metrization of probabilistic convergence groups*, Math. Slovaca, 67 (2017), pp. 985–1000.
- [2] T. M. G. AHSANULLAH AND G. JÄGER, *Probabilistic convergence transformation groups*, Math. Slovaca, 68 (2018), pp. 1447–1464.
- [3] G. JÄGER, *Probabilistic approach spaces*, Math. Bohem., 142 (2017), pp. 277–298.
- [4] R. LOWEN, *Approach spaces: a common supercategory of TOP and MET*, Math. Nachr., 141 (1989), pp. 183–226.