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Metric trees in the Gromov–Hausdorff space

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Abstract: Using the wedge sum of metric spaces, for all compact metrizable spaces, we construct a topological embedding of the compact metrizable space into the set of all metric trees in the Gromov–Hausdorff space with finite prescribed values. As its application, we show that the set of all metric trees is path-connected and all its nonempty open subsets have infinite topological dimension.

Keywords: metric tree; Gromov–Hausdorff distance

AMS Subject Classification: 53C23, 51F99

REFERENCES

- [1] Berestovskii V. N., *On the Urysohn’s \mathbb{R} -tree*, Sibirsk. Mat. Zh. **60** (2019), no. 1, 14–27 (Russian); translation in Sib. Math. J. **60** (2019), no. 1, 10–19.
- [2] Bridson M. R., Haefliger A., *Metric Spaces of Non-positive Curvature*, Grundlehren der mathematischen Wissenschaften, 319, Springer, Berlin, 1999.
- [3] Evans S. N., *Probability and Real Trees*, Lectures from the 35th Summer School on Probability Theory held in Saint-Flour, 2005, Lecture Notes in Mathematics, 1920, Springer, Berlin, 2008.
- [4] Herron D. A., *Gromov–Hausdorff distance for pointed metric spaces*, J. Anal. **24** (2016), no. 1, 1–38.
- [5] Ishiki Y., *An interpolation of metrics and spaces of metrics*, available at arXiv:2003.13227v1 [math.MG] (2020), 23 pages.
- [6] Ishiki Y., *Branching geodesics of the Gromov–Hausdorff distance*, Anal. Geom. Metr. Spaces **10** (2022), no. 1, 109–128.
- [7] Ishiki Y., *Continua in the Gromov–Hausdorff space*, Topology Appl. **312** (2022), Paper No. 108058, 10 pages.
- [8] Ishiki Y., *Fractal dimensions in the Gromov–Hausdorff space*, available at arXiv: 2110.01881v5 [math.MG] (2022), 24 pages.
- [9] Jansen D., *Notes on pointed Gromov–Hausdorff convergence*, available at arXiv: 1703.09595v1 [math.MG] (2017), 48 pages.
- [10] Kelly J. L., *General Topology*, Graduate Texts in Mathematics, 27, Springer, New York, 1955.
- [11] Mémoli F., Wan Z., *Characterization of Gromov-type geodesics*, available at arXiv: 2105.05369v2 [math.MG] (2021), 58 pages.
- [12] Urysohn P., *Beispiel eines nirgends separablen metrischen raumes*, Fund. Math. **9** (1927), no. 1, 119–121.