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Norms on Categories and Generalized Schröder-Bernstein Theorems

Abstract. We generalize the concept of a norm on vector space to the concept of a norm on a category. This provides a unified perspective on many specific matters in many different areas of mathematics like set theory, functional analysis, measure theory, topology, and metric space theory. We will especially elaborate on the two last areas with special focus on the Gromov-Hausdorff distance. In our formalization a Schröder-Bernstein property becomes an axiom of a norm which constitutes interesting properties of the categories in question. The concept of normed categories provides a convenient framework for metrizations.

Biographical Sketch. Dr. Luckhardt received his Bachelor of Science from Göttingen University in 2011, followed by his Master of Science in 2014. From 2014–2018, he then completed his PhD in Mathematics at Göttingen University under the supervision of Thomas Schick. He held a position at Augsburg University 2017–2018, and a postdoc position at Ben-Gurion University of the Negev 2018–2020.