The Lipschitz free space of a metric space

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Let M be a metric space. There exists a Banach space X containing M isometrically such that every Lipschitz mapping f from M into any Banach space Y admits a unique extension to a linear operator F from X into Y whose operator norm is equal to the Lipschitz constant of f. X is essentially unique and is called the Lipschitz free space or the Arens-Eells space of M. The norm of X is called the Kantorovich-Rubinstein or the Wasserstein norm or distance. It was originally considered by these authors c. 1942 in connection with a transportation cost minimization problem in economics. In computer science it is called the earth-mover distance. We shall go through the construction of X and the transport cost interpretation of the norm. If time permits, we will describe some recent results concerning the Lipschitz free space of some recursively defined families of finite metric spaces.

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