

Diffusive metrics induced by random affinities on graphs. An application to the transport systems related to the COVID-19 setting for Buenos Aires (AMBA)

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Abstract: The aim of this paper is twofold. First we shall provide a graph metric on the set of vertices determined by the expected value of random affinities between them. This is accomplished by applying the diffusive metric defined by the spectral analysis of the Laplacian determined on the graph by the affinity. As an application we provide a metric in the set of the 41 cities belonging to the largest urban concentration in Argentina based on public transport and neighborhood. The results can be applied to predict and control the spread of COVID-19 and other pandemic diseases in such a setting.

Keywords: weighted graphs, diffusion, graph Laplacian, metrization, COVID-19