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Approximate inverse systems of uniform spaces and an application of inverse systems

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Abstract: The fundamental properties of approximate inverse systems of uniform spaces are established. The limit space of an approximate inverse sequence of complete metric spaces is the limit of an inverse sequence of some of these spaces. This has an application to the dimension of the limit space of an approximate inverse system. A topologically complete space with $dim \leq n$ is the limit of an approximate inverse system of metric polyhedra of $dim \leq n$. A completely metrizable separable space with $dim \leq n$ is the limit of an inverse sequence of locally finite polyhedra of $dim \leq n$. Finally, a new proof is derived of the important equality $dim = Ind$ for metric spaces.

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