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L(Metric Criteria for convergence in Bayesian Recursive Inference Systems

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Motivated by application to probabilistic inference, we consider a sequence of probability measures, called "conclusion measures," on a fixed space X. The sequence is generated recursively via conditional probability, driven by a sequence of input measures (rather than by a sequence of punctual data, as in Bayesian statistical inference). The general problem is to give conditions on the input measures so that the sequence of conclusion measures converges weakly. We develop L(metric criteria defined recursively on the input measures, which are sufficient (but not necessary) for the sequence of conclusion measures to converge at a given rate. We discuss the applications of this to the "directed convergence strategy" introduced in [1]. Finally, we show that if the input measures satisfy the criteria, then the input sequence also converges at a comparable rate.