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Strategies for prediction under imperfect monitoring

We propose simple randomized strategies for sequential prediction under imperfect monitoring, that is, when the forecaster does not have access to the past outcomes but rather to a feedback signal. The proposed strategies are consistent in the sense that they achieve, asymptotically, the best possible average reward. It was Rustichini (1999) who first proved the existence of such consistent predictors. The forecasters presented here offer the first constructive proof of consistency. Moreover, the proposed algorithms are computationally efficient. We also establish upper bounds for the rates of convergence. In the case of deterministic feedback, these rates are optimal up to logarithmic terms.

Joint work with Shie Mannor, McGill University, Montreal, and Gabor Lugosi, ICREA and Universitat Pompeu Fabra, Barcelona.