Change-point detection for infinite horizon dynamic treatment regimes

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Abstract: A dynamic treatment regime is a set of decision rules for how to treat a patient at multiple time points. At each time point, a treatment decision is made depending on the patient's medical history up to that point. We consider the infinite-horizon setting in which the number of decision points is very large. Specifically, we consider long trajectories of patients' measurements recorded over time. At each time point, the decision whether to intervene or not is conditional on whether or not there was a change in the patient's trajectory. We present change-point detection tools and show how to use them in defining dynamic treatment regimes. We demonstrate the utility of the proposed change-point detection for detecting sepsis in preterm infants in the intensive care unit.