

This thesis provides two characterisations of the entropy-related update methods, in terms of invariants. The Method of Minimising Relative Entropy (MRE) is characterised as preserving the evaluations of generalised proportions when this update method is applied to the problem of establishing new expected values of some random variables (Theorem 2.3.2). In contrast, the Method of Minimising Inverse Relative (MIRE) is characterised as preserving the expected values of some random variables when updating the evaluations of generalised proportions (Theorem 3.3.1).

Moreover, as demonstrated here, both methods cannot be characterised in a similar manner (as preserving invariants) when they are applied to opposite types of problems: MRE to updating evaluations of generalised proportions and MIRE to updating expected values of random variables. These results have straightforward consequences for i.a. the “Simultaneous Update Problem” and the “Judy Benjamin Problem”.