

## **Barycentre of Models**

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When models are trained on data alone, they may not accurately reflect a modeller's view, an expert's judgement, or user inputs. Moreover, on many occasions the experts disagree and thus their models, potentially trained on different datasets, need to be combined. To amalgamate the conflicting nature of expert's views, we propose a modified Barycentre approach. Specifically, each expert proposes an  $n$ -dimensional stochastic process driven by different Brownian motions. The combined meta model is created by penalising each experts' model using a weighted relative entropy, where the weights may be proportional to an expert's historical performance. We prove existence and uniqueness of the meta model, derive its dynamics, and develop deep learning algorithms to estimate the barycentre of models. Furthermore, we allow the meta model to satisfy agreed upon external views, in which case the meta model is modify in a minimal manner to respect the external beliefs.

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