

Towards a Measurement Theory for Data Science and Artificial Intelligence – Postdoc and PhD opportunities –

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I am offering a **two-year postdoctoral position** starting early 2019 to work on the important topic of *measurement theory* and its uses in machine learning, data science and AI. **PhD positions** may also be available. Please get in touch if the below sounds of interest.

Issues of measurement are of particular importance in inductive sciences including data science and artificial intelligence, for example when we assess the capability of our models and learning algorithms to generalise beyond the observed data.

This project funded by the Alan Turing Institute will seek to make fundamental advances in our understanding of capabilities and skills of models and algorithms in data science and AI, and how to measure those capabilities and skills. Just as psychometrics has developed tools to model the skills of a human learner and develop standardised (SAT) tests, so we need similar tools to model the skills of learning machines and have standardised benchmarks which will allow skill assessment with only a few well-chosen test sets.

The figure below is from a paper I'm presenting at AAAI'19 in January. One of the questions I consider is under what circumstances a performance measure in an aggregate confusion matrix corresponds to the arithmetic mean of the measures in each individual confusion matrix.

Spoiler alert: this holds for accuracy but not for F-score! You can find a preprint of the paper here: <http://people.cs.bris.ac.uk/~flach/papers/Performance-AAAI19.pdf>.

