Notes on New Method for Calculating NRR Assessor Sensitivity

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We are dealing with a curve where a measure m is calculated for increasing magnitudes of perturbation/misregistration, d. At each level of misregistration d_i we have one particular value of m, with corresponding standard error, σ_i.

As well as this standard error which is related to the number of samples we use to measure m (the uncertainty in the measure), we have another uncertainty, due to repetition, or separate "trials".

i $\leftarrow m_i$, i.e. the index i is related to the measures whereas, on the other hand, j indexes the trials. m_{ij} is the measure at one particular point for a particular trial and S (or D in prior papers), the sensitivity of the measure, is what we seek to identify.

To measure the mean of m, we use the summation thus

$$\bar{m}_i = \sum_j^N \frac{m_{ij}}{N}.$$

And the errors are summarised in a messy fashion in the sets of equations below.

$$\sigma_{\bar{m}_i} = \frac{\sigma_{m_{ij}}}{\sqrt{N}}$$

$$\sigma_{\sigma_{\bar{m}_i}} = \frac{\sigma_{m_{ij}}}{\sqrt{2N}}$$

$$\sigma_{\bar{m_{ij}}} \pm \sigma_{\sigma_{\bar{m}_{ij}}}$$

$$\sqrt{\sum_j^n \sigma^2_{\sigma_{\bar{m}_i}}}$$

$$S + \sigma_s$$

$$<\bar{\sigma}_{\bar{m}_i}> <\bar{\sigma}_{\sigma_{\bar{m}_i}}>$$

N is the number of repeated experiments, among the instantiations that we have.

We fit a function to the measures curve (e.g. Specificity or overlap) and its error bars and then compute the ratio of the curve over the mean of all inter-instantiation error bars. Error should be added and aggregated too, in lines with some of the rules above.