Two robustness ideas for meta-analysis

A seminar by Art Owen

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Room Benvenuti
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This talk presents some ideas about merging p-values from multiple data sets. One of the most restrictive problems of this kind arises when all one has are p values. The first topic was motivated by some work in bioinformatics. The goal was to identify genes that changed their expression level with age. Ideally the expression should either be increasing in all or most tissues, or decreasing in all or most tissues. The solution was a method that Karl Pearson proposed in the 1930s that was (wrongly) thought to be inadmissible for over 50 years, but is actually more powerful than Fisher's test when the effects tend to have the same sign. The second part is about partial conjunction tests where, to get replicability, we want to be sure that a hypothesis can be confidently rejected at least r times out of n trials. Taking r > 1 provides robustness against the possibility that one extremely significant p value has been obtained due to an error.

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