

Quantitative Evaluation of Large Maps of Science

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ABSTRACT

We describe recent improvements in mapping the world-wide scientific literature. Existing research is extended in three ways. First, a method for generating maps directly from the data on the relationships between hundreds of thousands of documents is presented. Second, quantitative techniques for evaluating these large maps of science are introduced. Third, these techniques are applied to data in order to evaluate eight different maps. The analyses suggest that accuracy can be increased by using a modified cosine measure of relatedness. Disciplinary bias can be significantly reduced and accuracy can be further increased by using much lower threshold levels. In short, much larger samples of papers can and should be used to generate more accurate maps of science.