

THE COMPRESSION PROBLEM IN MACHINE LEARNING
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A concept class in machine learning has complexity measured by its Vapnik Chervonenkis (VC) dimension. A basic result is that a class is learnable if and only if the VC dimension is finite. On the other hand, if a concept class can be compressed requiring much less information for its description, then the class is learnable and has finite VC dimension. The compression problem is whether the converse is true i.e. does finite VC dimension imply existence of a compression scheme.

I will describe joint work with my son Ben (a computer scientist) and his former supervisor at Berkeley Peter Bartlett on this. In particular, combinatorial geometry and topology are very useful for this question.

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