Abstract

Principal Component Analysis is a method for approximating an observed matrix by a low rank matrix with respect to *uniform* noise and has been well studied. A similar problem is Robust Principal Component Analysis (RPCA), where we approximate an observed matrix by a low rank matrix with respect to *sparse* noise. However, this slight change in how we measure error makes the optimization problem much more difficult and has attracted recent interest [1, 6].

Our goal is to develop a probability based message passing approach to solve RPCA. Instead of minimizing the rank of our approximation, we will we model our approximation as the product of two low dimensional random matrices and estimate their posterior distributions. We expect that this approach will perform well on matrices as it has been shown to perform well in the related field of compressed sensing on vectors[5, 3]. Finally, we will test and compare our theoretic model to alternative approaches on both synthetic and real world examples.

References

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