

Accepted Manuscript

Fixed-point algorithms for frequency estimation and structured low rank approximation

Fredrik Andersson, Marcus Carlsson

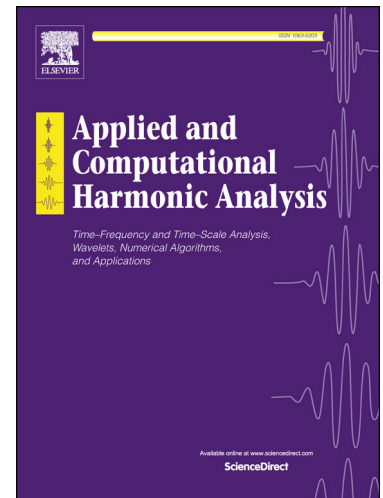
PII: S1063-5203(17)30024-6
DOI: <http://dx.doi.org/10.1016/j.acha.2017.03.004>
Reference: YACHA 1190

To appear in: *Applied and Computational Harmonic Analysis*

Received date: 25 June 2015
Revised date: 23 March 2017
Accepted date: 28 March 2017

Please cite this article in press as: F. Andersson, M. Carlsson, Fixed-point algorithms for frequency estimation and structured low rank approximation, *Appl. Comput. Harmon. Anal.* (2017), <http://dx.doi.org/10.1016/j.acha.2017.03.004>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Fixed-point algorithms for frequency estimation and structured low rank approximation

Fredrik Andersson^{a,*}, Marcus Carlsson^a

^aCentre for Mathematical Sciences, Lund University, Box 118, 22100 Lund, Sweden

Abstract

We develop fixed-point algorithms for the approximation of structured matrices with rank penalties. In particular we use these fixed-point algorithms for making approximations by sums of exponentials, i.e., frequency estimation. For the basic formulation of the fixed-point algorithm we show that it converges to the solution of a related minimization problem, namely the one obtained by replacing the original objective function with its convex envelope and keeping the structured matrix constraint unchanged.

It often happens that this solution agrees with the solution to the original minimization problem, and we provide a simple criterion for when this is true. We also provide more general fixed-point algorithms that can be used to treat the problems of making weighted approximations by sums of exponentials given equally or unequally spaced sampling. We apply the method to the case of missing data, although the above mentioned convergence results do not hold in this case. However, it turns out that the method often gives perfect reconstruction (up to machine precision) in such cases. We also discuss multidimensional extensions, and illustrate how the proposed algorithms can be used to recover sums of exponentials in several variables, but when samples are available only along a curve.

Keywords: fixed-point algorithms, frequency estimation, general domain Hankel matrices, Fenchel conjugate, convex envelope
2010 MSC: 15B05, 65K10, 41A29, 41A63,

*Corresponding author

Email addresses: fa@maths.lth.se (Fredrik Andersson), mc@maths.lth.se (Marcus Carlsson)

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات