Marginal gains?

1. Clear research question of interest to community?
2. Clear answer, one-line summary or take-home point?
3. Reason for work to be cited?
4. Interest beyond research community?
5. Core findings clear and immediate?
6. Presentation professional?
7. Title, abstract, opening and closing statements engaging?
8. Figures and captions communicate clear message?
9. Statistical or mathematical analysis convincing?
10. Results validated real data or systems?
11. Software or data linked to paper to exploit?

What kind of problems in practice? Take titles …

7

Extreme titles

- In 2012, average number of title words was 12.4. In EEE, 11.4
- Long titles >21 words and short titles <5 five words rare, about 5%.
- Here is a bad long example (23 words):

  "Performance of recent and high-performance approximate density functionals for time-dependent density functional theory calculations of valence and Rydberg electronic transition energies"
- Now tidied (13 words):

  useful detail

  "Performance of 30 time-dependent density functionals in predicting valence and Rydberg excitations"
- Alternatively, with shift in emphasis:

  author's abbreviation

  "Valence and Rydberg excitations predicted by 30 time-dependent density functionals " (11 words) …

8

Isegawa et al. (2012) [19]
A Concise Guide to Communication in Science and Engineering, Foster, OUP, 2017

Extreme abstracts

- Extremely short example (10 words):

  "Unitarity and geometrical effects are discussed for photon-photon scattering"
- No motivation for the work, no methods, and no implications.
- Compare title: "Unitarity constraints and role of geometrical effects".
- Abstract just adds "photon-photon scattering".

[Other examples omitted]

9

Troshin and Tyurin (2002)
A Concise Guide to Communication in Science and Engineering, Foster, OUP, 2017

Good abstract

Context, problem

Separation of sources consists of recovering a set of signals of which only instantaneous linear mixtures are observed. In many situations, no a priori information on the mixing matrix is available: The linear mixture should be "blindly" processed. This typically occurs in narrowband array processing applications when the array manifold is unknown or distorted. This paper introduces a new source separation technique exploiting the time coherence of the source signals. In contrast with other previously reported techniques, the proposed approach relies only on stationary second-order statistics that are based on a joint diagonalization of a set of covariance matrices. Asymptotic performance analysis of this method is carried out; some numerical simulations are provided to illustrate the effectiveness of the proposed method.

Methods

Main result

More results, impact

10

Belouchrani, 1997 [900]
A Concise Guide to Communication in Science and Engineering, Foster, OUP, 2017

Introduction: great openings

"The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently …"

(Shannon, *Bell Syst Tech J*, 1948)

Atrial fibrillation is the most common of all sustained cardiac arrhythmias, with the prevalence increasing with age to up to 5 percent in persons more than 65 years of age, and it is a major cause of stroke.[1-3] Experimental studies ..."

(Haissaguerre et al., *NEJM*, 1989) …

Conclusion: great closings

"In other words, no matter how we set out limits of reliability, we can distinguish reliably in time *T* enough messages to correspond to about *CT* bits, when *T* is sufficiently large. …"

(Shannon, *Bell Syst Tech J*, 1948)

"Additional studies are necessary … before widespread application of ablation for the treatment of this common cardiac rhythm disturbance can be recommended."

(adapted Haissaguerre et al., *NEJM*, 1989)

Great writing takes continuing effort. But it pays. ■