Maastricht University

Sparse estimation: applications in atrial fibrillation

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SPARSE ESTIMATION

APPLICATIONS IN ATRIAL FIBRILLATION

1. By applying ℓ_1-norm minimization, one can correctly reconstruct a large, but sparse parameter vector in a linear regression problem, given only a very limited amount of available observations. *(this thesis, Chapter 3)*

2. In state-space models, natural model equivalence provides an opportunity to find a sparser model representation, but prediction error related model equivalence in an underdetermined setting introduces the risk of estimating unstable sparse models. *(this thesis, Chapter 4)*

3. Recurring wave front propagation patterns in atrial fibrillation can be identified by sparse multivariate autoregression of high-density contact mapping electrograms. *(this thesis, Chapter 7)*

4. Sparse logistic regression highlights the dominant noninvasive atrial fibrillation complexity parameters that predict successful pharmacological cardioversion of patients with paroxysmal atrial fibrillation. *(this thesis, Chapter 8)*

5. When estimating the (non-zero) parameters of any model that describes a dynamical process, one needs to have measured this process on an appropriate time scale.

6. The design of an appropriate experimental setup to test and validate an algorithm can, and probably should, take longer than performing the actual experiment itself.

7. (Standardization of) Noninvasive atrial fibrillation complexity quantification is a sine qua non in patient-tailored treatment of atrial fibrillation.

8. The notion of sparsity has permeated many fields of research in the last decade, and will become even more relevant to make sense of big data in the next. *(Valorization)*

9. Here's to equivalence, the cause of, and solution to, (nearly) all of life's problems. *(adapted from Matthew Abram Groening)*

10. "So it goes." *(Slaugtherhouse-Five, Kurt Vonnegut)*

Stef Zeemering, 26 november 2015