



Universiteit
Leiden
The Netherlands

E-values for anytime-valid inference with exponential families

Hao, Y.

Citation

Hao, Y. (2025, February 18). *E-values for anytime-valid inference with exponential families*. Retrieved from <https://hdl.handle.net/1887/4195433>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/4195433>

Note: To cite this publication please use the final published version (if applicable).

Stellingen

Behorende bij het proefschrift

E-Values for Anytime-Valid Inference with Exponential Families

1. Unlike p-values, e-values have the advantage of easily integrating evidence from multiple studies. (This dissertation)
2. The exponential family is important because it provides a unified framework for a wide range of statistical models, facilitates efficient computation, and serves as a theoretical foundation for modern statistical and machine learning methods. (This dissertation)
3. Acknowledging the importance of the exponential family enables us to identify growth-rate optimal e-variables for testing problems in well-specified models. (This dissertation)
4. One can bound the deviation of the empirical mean by using a multivariate concentration inequality that combines ideas of Imre Csiszár, Ivan Nikolaevich Sanov, and Herman Chernoff, and therefore refer to our result as the "Csiszár-Sanov-Chernoff" bound. (This dissertation)
5. "Science is the art of interpretation." Tools like e-values enhance the interpretability of data but should not replace the scientist's critical reasoning in drawing conclusions.
6. Statisticians are scientists who apply mathematical tools to solve practical problems, making it essential for their research to be grounded in real-world challenges.
7. Every elegant statistical method should be applicable both theoretically and practically.
8. Hypothesis testing is less about discovering universal truths and more about navigating between competing models of understanding within a contingent and uncertain universe.
9. As I learned in the Netherlands, neither bicycles nor hypotheses can stand on their own: without power (momentum for bicycles, data for hypotheses), they collapse.
10. Similarly to what happens on the arXiv platform, peer-reviewed academic papers should be made freely available.
11. My favorite Chinese restaurant in Amsterdam is Jiang Nan, a popular spot for those seeking variety beyond Sichuan and Cantonese cuisine. Amsterdam people could benefit from more restaurants offering diverse regional Chinese flavors.

Yunda Hao

Leiden, February 18, 2025