

Title: Adaptive Rejection Sampling

In adaptive rejection sampling (ARS), the rejection envelope converges to the density function as sampling proceeds. This allows us to achieve a high acceptance ratio, an important consideration when computing the density function is computationally expensive. First, we consider several ways ARS is implemented, such as Standard Adaptive Rejection Sampling (SARS), Adaptive Rejection Metropolis Sampling (ARMS), and Concave-Convex Adaptive Rejection Sampling (CCARS). Next, we investigate the derivation, implementation and testing of one ARS method through Jupyter Notebook simulation. Finally, we consider a select few applications of ARS, such as Bayesian Inference in AI/ML, computational biological analysis, and psychological modeling, and discuss how adaptive rejection sampling may be improved in the future.

Citations:

Gilks, W. R., & Wild, P. (1992). Adaptive Rejection Sampling for Gibbs Sampling. *Journal of the Royal Statistical Society. Series C (Applied Statistics)*, 41(2), 337–348.
<https://doi.org/10.2307/2347565>

Hartmann, R., Meyer-Grant, C. G., & Klauer, K. C. (2023). An adaptive rejection sampler for sampling from the Wiener diffusion model. *Behavior Research Methods*, 55(5), 2283–2296. <https://doi.org/10.3758/s13428-022-01870-z>

Silva, A. R. S., Azevedo, C. L. N., Bazán, J. L., & Nobre, J. S. (2021). Bayesian inference for zero-and/or-one augmented beta rectangular regression models. *Brazilian Journal of Probability and Statistics*, 35(4), 749–771.

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Final exams:

- Computer Networks, May 5
- Operating Systems, May 13