Computer Science > Information Theory

Distributed Functional Scalar Quantization Simplified

John Z. Sun, Vinith Misra, Vivek K Goyal

(Submitted on 6 Jun 2012)

Distributed functional scalar quantization (DFSQ) theory provides optimality conditions and predicts performance of data acquisition systems in which a computation on acquired data is desired. We address two limitations of previous works: prohibitively expensive decoder design and a restriction to sources with bounded distributions. We rigorously show that a much simpler decoder has equivalent asymptotic performance as the conditional expectation estimator previously explored, thus reducing decoder design complexity. The simpler decoder has the feature of decoupled communication and computation blocks. Moreover, we extend the DFSQ framework with the simpler decoder to acquire sources with infinite-support distributions such as Gaussian or exponential distributions. Finally, through simulation results we demonstrate that performance at moderate coding rates is well predicted by the asymptotic analysis, and we give new insight on the rate of convergence.

Subjects: **Information Theory (cs.IT)**
Cite as: **arXiv:1206.1299 [cs.IT]**
(or **arXiv:1206.1299v1 [cs.IT]** for this version)

Submission history

From: John Sun [view email]
[v1] Wed, 6 Jun 2012 19:00:45 GMT (98kb)

Which authors of this paper are endorsers?