

Re: how to find the best ADC step size?

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From: Randy Yates (randy.yates_at_sonyericsson.com)

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"Clay S. Turner" <Physics@Bellsouth.net> writes:

> "Randy Yates" <randy.yates_at_sonyericsson.com> wrote in message
> news:xxpllbgjpf.fsf@usrts005.corpusers.net...
> > "Clay S. Turner" <Physics@Bellsouth.net> writes:
> > > [...]
> > > The idea is to try to make each symbol contribute equally to the overall
> > > process. Imagine looking at your data after a huge number of symbols was
> > > received. The idea is to make the info provided by each type of symbol
> > > contribute equally.
> >
> > But this Huffman coding won't do that. Choosing a representation for a
> > symbol doesn't change the probability of the symbol occurring. It
> > does, however, minize the average symbol rate – I certainly see
> > that. Perhaps I'm being blind?
> > --
>
> Hello Randy,
>
> The Huffman problem and the quantization problem are related in they both
> implement methods to effectively flatten out variations. True they are
> different in that the Huffman problem is trying to minimize the average
> number of bits per sample and the quantization problem is trying to maximize
> the information per sample. The differences arise from the constraints and
> what you are starting with. In one case we have a fixed amount of
> information, so how few total bits can we fit all of the info in. The
> theoretical answer is the entropy, but the practical answer (comes from
> requiring whole numbers of bits in a symbol is the Huffman entropy.) In the
> other case we have a fixed symbol size, so how can we get the most info per
> symbol. The connection is the entropy and its maximization requires a flat
> distribution.
>
> In Huffman coding we sort the symbol probabilities into descending order and
> then we make multiple passes throught the list each time combining the two
> lowest probilites together. So we are essentially trying to make each path's
> probability be the same or at least similar. In the quantization we are just
> diving up the total probability into N equal regions.

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>
> *You are not being blind, you are just asking how two seemingly different*
> *things are related. And the relation is through a flattening out of the*
> *probabilty function.*
>
> *I hope this helps to clear some things up.*
>
> *Clay*

Intriguing stuff! I'm not sure I follow the sorting description, but that's OK. I need to go back and read fully and with understanding the seminal Shannon papers.

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