Differential Coding

A potential problem if lossy compression is used.

Ex: $\hat{d}$ and $\hat{x}$ denote lossy version of d and x.
"round" is the function causing loss.

	x	10	10.3	10.6	10.9	...
encoder <	d	10	0.3	0.3	0.3	
	$\hat{d}$	10	0	0	0	
decoder –	$\hat{x}$	10	10	10	10	← far from 10.9 ∵ errors accumulated

Solution: Encoder should use the lossy $\hat{x}$, because decoder only sees $\hat{x}$, i.e. $d_n = x_n - \hat{x}_{n-1}$

Decoder: $\hat{x}_n = \hat{x}_{n-1} + \hat{d}_n$

	x	10	10.3	10.6	10.9	...
encoder <	d	10	0.3	0.6	-0.1	
	$\hat{d}$	10	0	1	0	
decoder –	$\hat{x}$	10	10	11	11	← very close to 10.9.