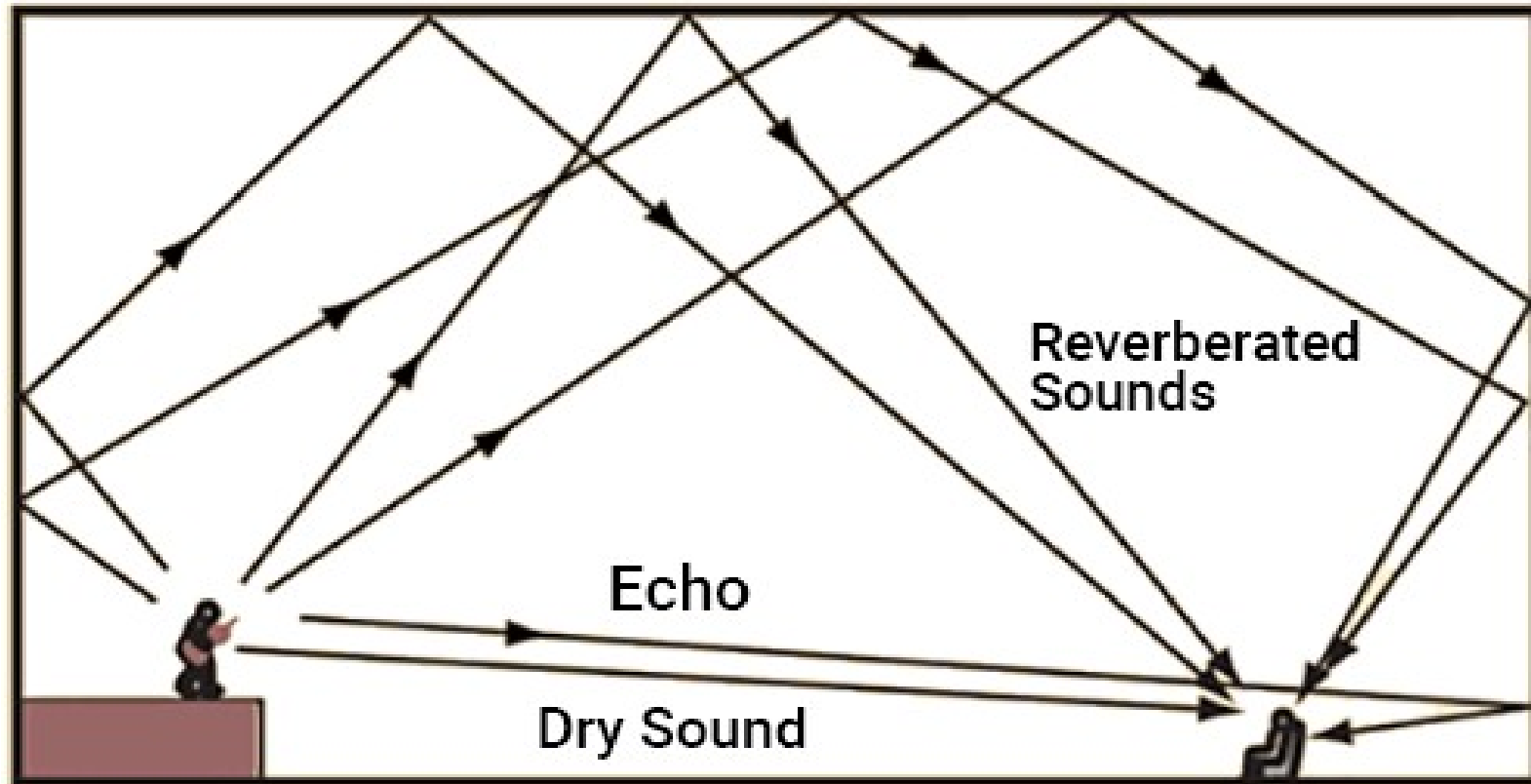


Remove reverb from sound



Reverb = echo from walls



- source: <https://www.softdb.com/what-is-reverberation-in-acoustical-analysis/>

Use cases

1) professional music production

- real time
- high quality

2) home recordings

- post production for e.g. youtubers
- not real time

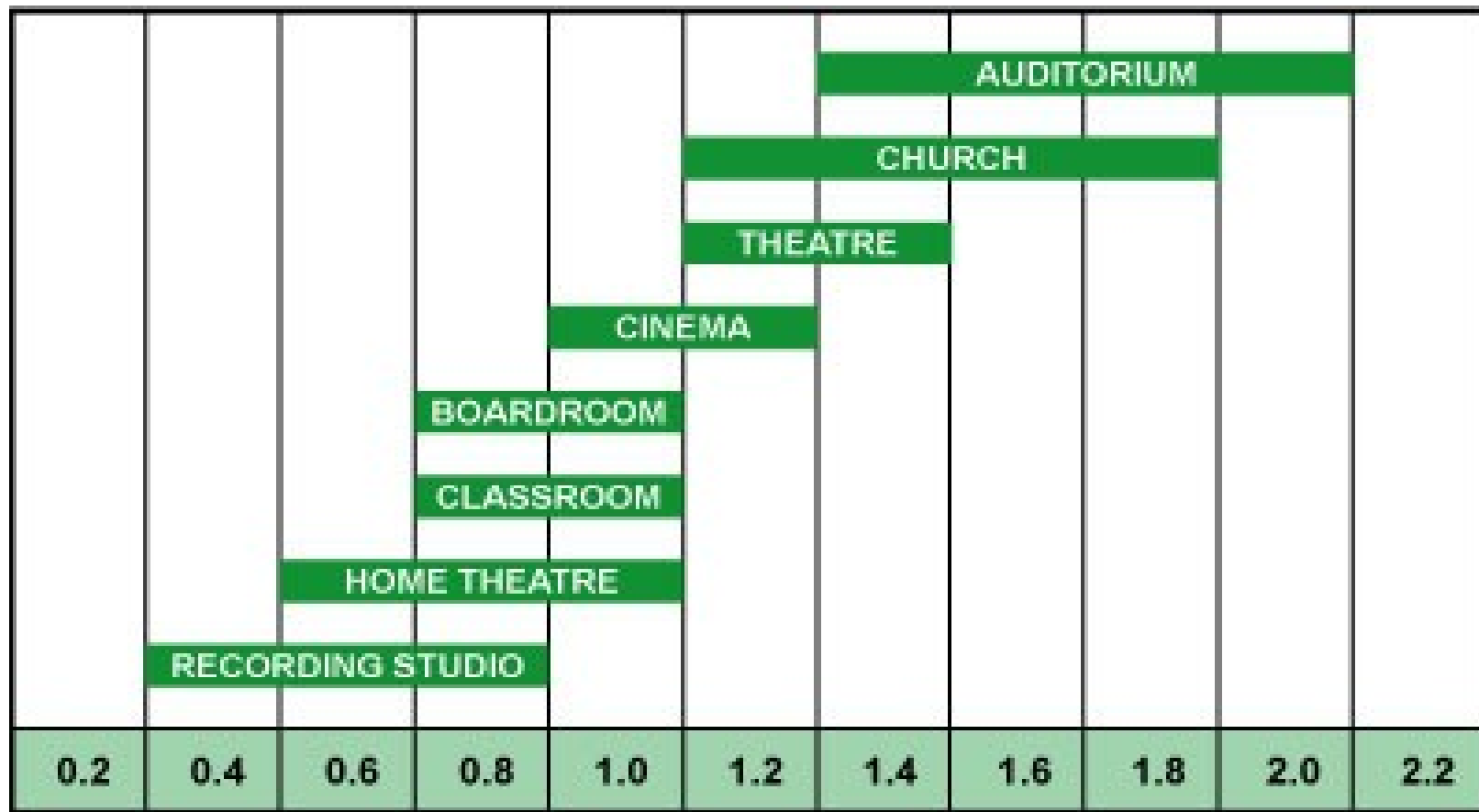
3) speech transfer

- zoom, phone calls
- real time
- lower quality is sufficient

Generate sound with reverb

- anechoic sound + convolution with IR = sound with reverb
-
- $$\int_0^t f(t-y)g(y)dy = h(t)$$
- IR: impulse response characterizes the room acoustics
- can be computed with FFT
- depends on:
 - room size and shape
 - position of source and receiver
 - shape and size of objects in the room

Reverberation times



- source : <https://www.primacoustic.com/broadway-panels/science/common-reverberation-times/>

Remove reverb from sound by deconvolution

- deconvolution with **known** IR
- can be done by FFT
- numerically unstable: strong amplification of even small noise
- better, but not perfect: Wiener deconvolution

Blind dereverberation

- deconvolution with **unknown** IR
-
- one possible approach:
 - sample space of relevant IR sufficiently
 - classify IRs with a neural network
 - deconvolve by Wiener deconvolution
-

Blind dereverberation