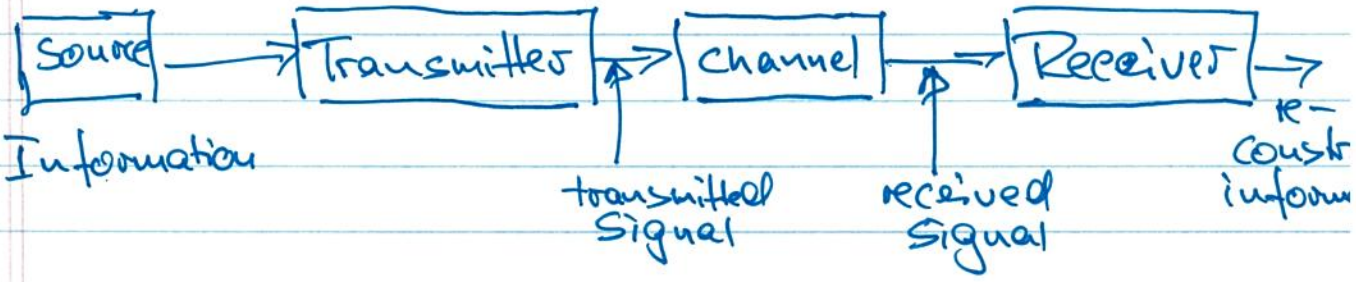
Introduction

8/27/18

Block diagram of a generic communication system



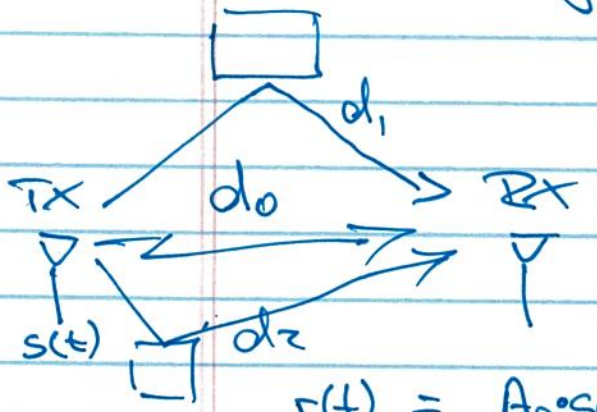
Transmitter:

"prepares" signal for transmission

- called modulation
  + maps information to signal
  + signal must be suitable for channel

- propagation (antennas
- channel assignment
  + regulatory
  + multiplexing
- reduce the effects of noise and interference

Channel: describes the physical effects (impairments) that the transmitted signal experiences while propagating to the receiver.



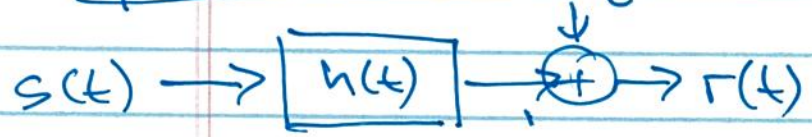
- noise
- pathloss

> signal-to-noise ratio (SNR)

- undesired (linear) filtering
  + e.g. multipath
- non-linear distortion

$$r(t) = A_0 \cdot s\left(t - \frac{d_0}{c}\right) + A_1 \cdot s\left(t - \frac{d_1}{c}\right) + A_2 \cdot s\left(t - \frac{d_2}{c}\right) + N_t$$

equivalent to:



with $$h(t) = A_0 \cdot \delta\left(t - \frac{d_0}{c}\right) + A_1 \delta\left(t - \frac{d_1}{c}\right) + A_2 \delta\left(t - \frac{d_2}{c}\right)$$

Receiver: reconstruct information in the best possible manner