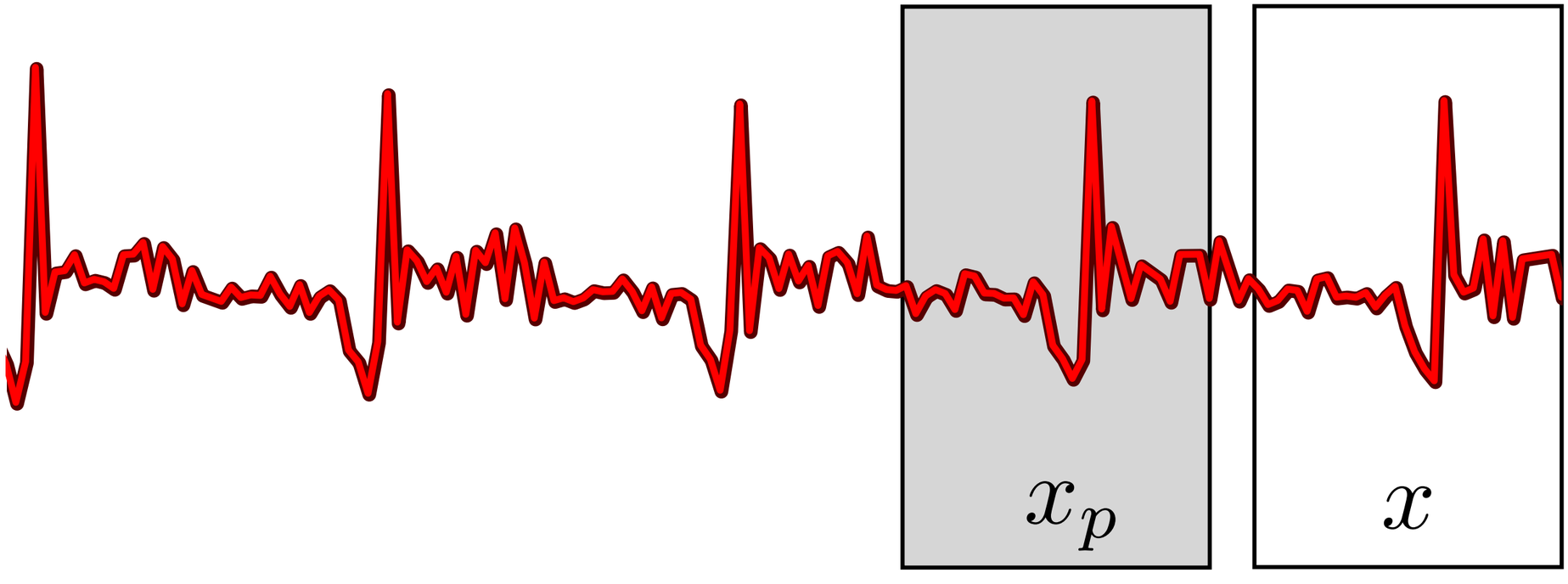
Pitch Detection



The solution of $\min_{p,k} \|x - kx_p\|^2$

is given by

$$p = \arg\max_p \left| \left\langle \frac{x_p}{\|x_p\|}, \frac{x}{\|x\|} \right\rangle \right|$$

$$k = \frac{\langle x_p, x \rangle}{\|x\|^2}$$