Convolution

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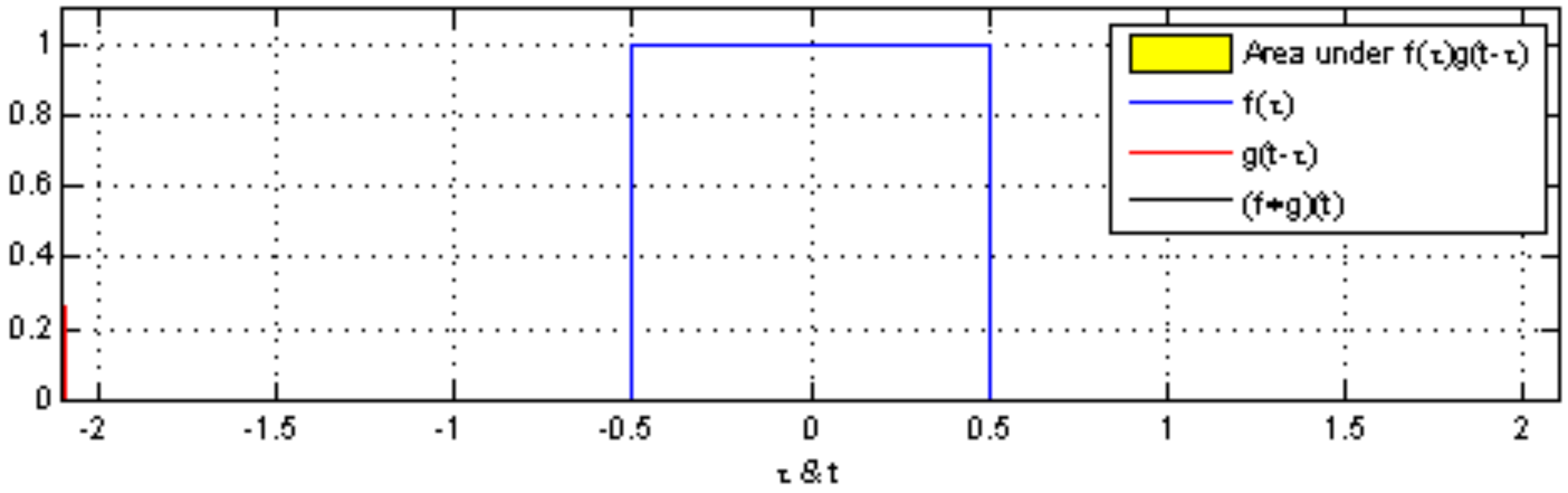
$$h_i^{r+1} = \sigma\Big(\underbrace{\sum_{j=-s}^{s} c_j \, h_{i-j}^{r}}_{z_i} \Big)$$

$$(\mathbf{c} \circledast \mathbf{h})_i = \sum_{j=-s}^{s} c_j \, h_{i-j}$$

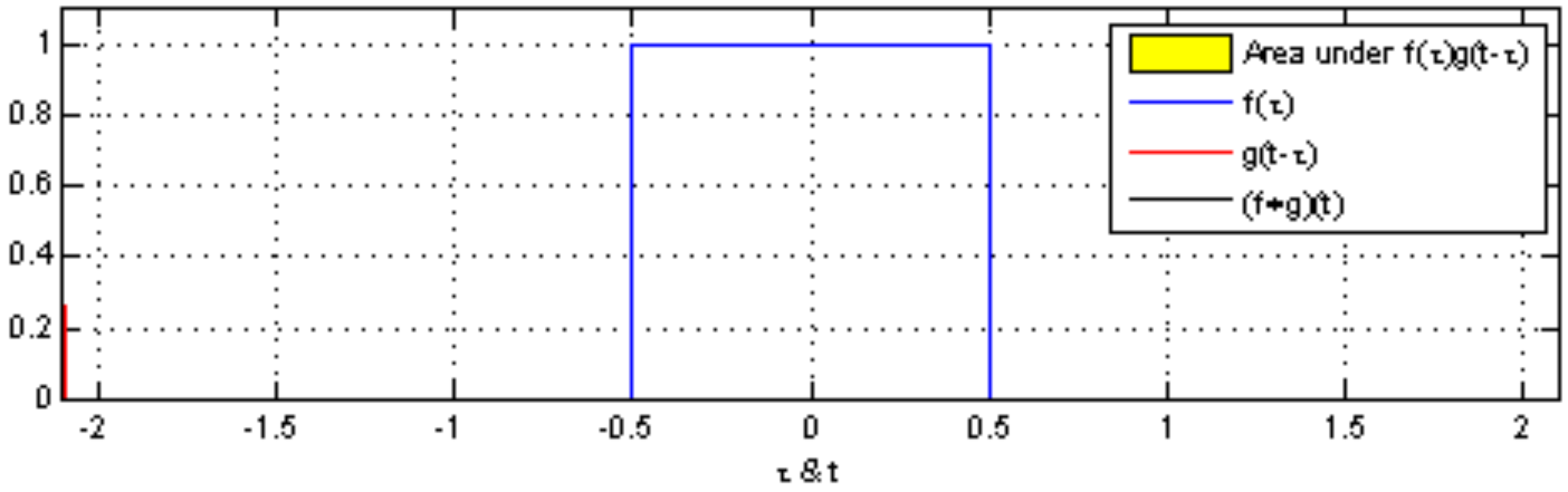

Area under f(τ)g(t-τ)
f(τ)
g(t-τ)
(f*g)(t)
1
0.8
0.6
0.4
0.2
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
τ & t

area

$h[i]$

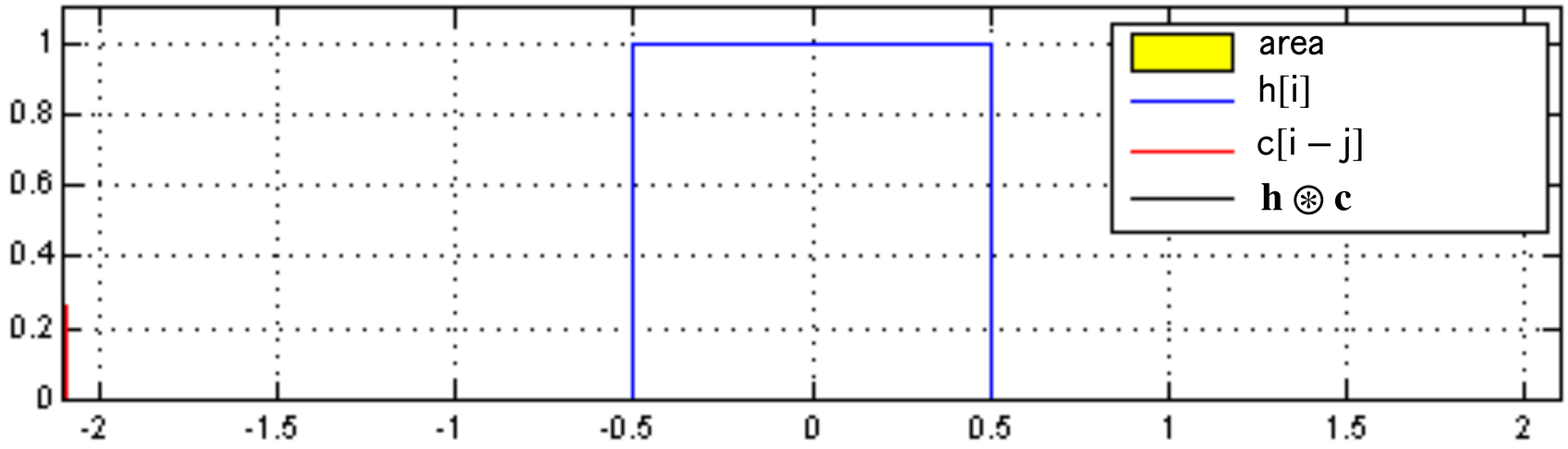
$c[i-j]$

$\mathbf{h} \circledast \mathbf{c}$


Area under f(τ)g(t-τ)
f(τ)
g(t-τ)
(f*g)(t)
1
0.8
0.6
0.4
0.2
0
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
τ & t

Convolution

$$h_i^{r+1} = \sigma\Big(\underbrace{\sum_{j=-s}^{s} c_j \, h_{i-j}^{r}}_{z_i} \Big) \qquad (\mathbf{c} \circledast \mathbf{h})_i = \sum_{j=-s}^{s} c_j \, h_{i-j}$$



Boundary Conditions

For $i \leq s$ and $i > r - s$:

Convolution is not uniquely defined