LEHRSTUHL FÜR MENSCH-MASCHINE-KOMMUNIKATION

Pattern Recognition

Tutorial No. 1
16.05.2014

Exercise 1

Given is the time-signal y = y(t). Show, that for the Laplace-transform of the derivative of the time-signal y'(t) yields:

$$Y'(s) = s \cdot Y(s) - y(0)$$

where Y'(s) denotes the transform of y'(t) and Y(s) denotes the transform of y(t).

Exercise 2

Determine the result of the z-transform of the following discrete functions:

a) Impulse:

$$y(k) = d(k) = \begin{cases} 1 & for \quad k = 0 \\ 0 & otherwise \end{cases}$$

b) Exponential function: $y(k) = a^k$

c) Mix-function: $y(k) = k \cdot a^k$

Exercise 3

Determine the result of a Fourier-transform of the following function and plot the absolute value of the spectrum as a function of the frequency **f**.