2007 Advanced Coding Theorem HW#1 Due date :2007.04.16

1. The same as the example in Lecture 2 except $\frac{E_s}{N_0} = \frac{1}{2}$ and

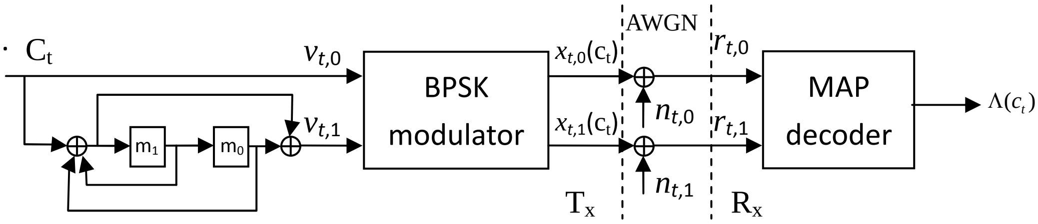
   $\mathbf{r} = (-1.6, 1.6, 1.1, -1.8, -0.5, 1.0, 0.1, 0.8)$.

   (a) Perform SOVA decoding.

   (b) Perform Max-log-MAP decoding.

   (c) Perform Log-MAP decoding.

2.



   (a) Plot the trellis diagram.

   (b) $\alpha_{t-1}(l) = ?$ for l = 0, 1 ,2, 3. ($l \equiv m_1 \cdot 2 + m_0$)

   (c) $\beta_t(l) = ?$ for l = 0, 1 ,2, 3.

   (d) $L(c_t) = ?$

	i=t-1	i=t	i=t+1
$\exp(-\frac{\lvert r_{i,0} - x_{i,0}(0)\rvert^2}{2\sigma^2})$	0.1	0.25	0.4
$\exp(-\frac{\lvert r_{i,0} - x_{i,0}(1)\rvert^2}{2\sigma^2})$	0.5	0.2	0.25
$\exp(-\frac{\lvert r_{i,1} - x_{i,1}(0)\rvert^2}{2\sigma^2})$	0.4	0.5	0.1
$\exp(-\frac{\lvert r_{i,1} - x_{i,1}(1)\rvert^2}{2\sigma^2})$	0.25	0.3	0.5
a priori probability $P_i(c_t=0)$	0.5	0.25	0.6

$\alpha_{t-2}(0) = 0.5$	$\beta_{t+1}(0) = 0.1$
$\alpha_{t-2}(1) = 0.2$	$\beta_{t+1}(1) = 0.5$
$\alpha_{t-2}(2) = 0.25$	$\beta_{t+1}(2) = 0.25$
$\alpha_{t-2}(3) = 0.4$	$\beta_{t+1}(3) = 0.2$

Rev.1.0