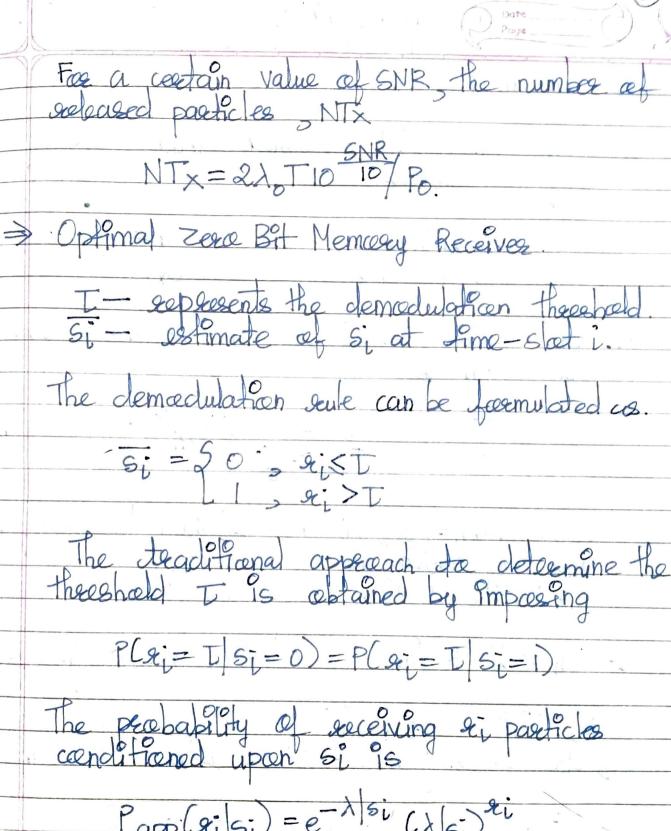


3 System Model Assumptions:

-> Temperature Ps constant

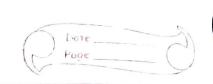
-> Viscosity n remains scime

-> Diffusion Coefficien is constant. I: = AT+ & sinci Here I represents the sum of ISI (Inter Symbol Interference) and the background noise. Fime. I he background noise pouler per unit The Parebability of societing si Information P(xi | I; +5°Co) = e (I;+5°Co) (I;+5°Co) 2i is the length of the Poisson channel > The SNR earlie 95 defined as SNR= 10 dog 10 Co



Papp ($\alpha_i | s_i$) = $e^{-\lambda | s_i}$ ($\lambda | s_i$) α_i where $\lambda | s_i = Cos_i + \sum_{j=1}^{i} C_j + \lambda_o T$

By the equality Papp(20 5=0)= Papp (aisi=1) In(1+ (0 5: (i/2+2)T) The threeshold which minimizes the BER of the zeroe-bit memory receiver is (T*) = deg min Pe(t) Pett) is the BER as a junction of I Pect) = 1 & Pecsinst) Pe(5:15T)=1[Q()T+5 5:-j(j, [T]) - 1-8CAT+ 5 si-j(j+6, FT) where $g(\lambda_n) = \xi e^{-\lambda_k} k$ is the Incomplete k=n k!Gramma function and $g(\lambda_n)=1$ => Optimal One Bit Memory Recover.



In order to optimize the performance of a one-bit memory receiver it has a reconstruction than the zeroe but memory releiver

5; = 50, 8; 5 [|si-1

Isi- Ps the threshold for the ith symbol when the province transmitted symbol is si-1

The optimal detection throshold of the one-bit memory succeiver can be given as-

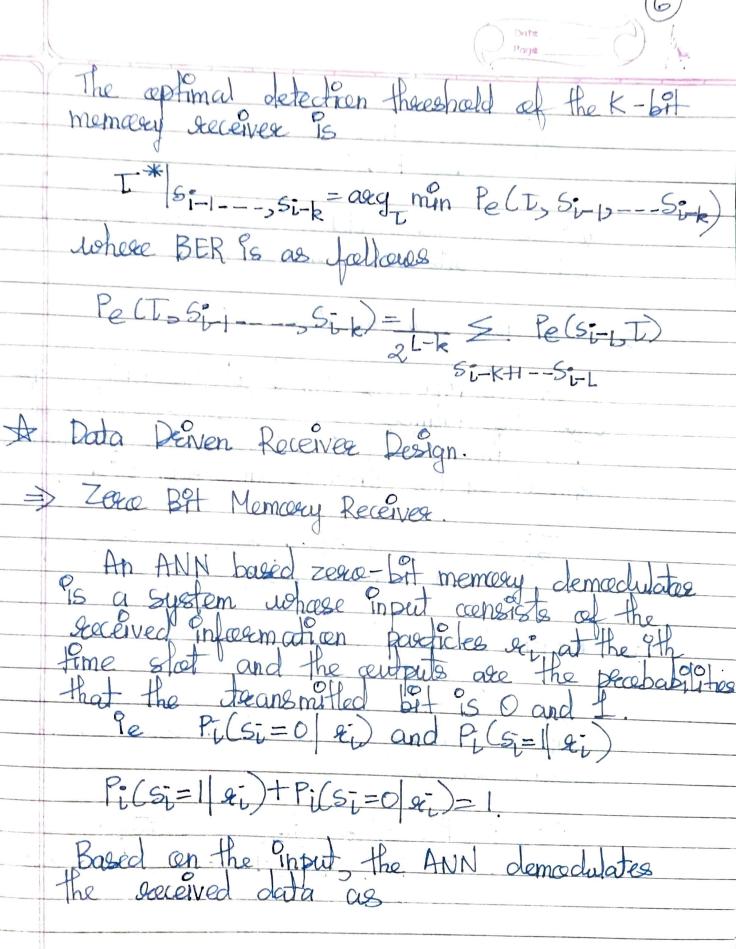
T* |si-1-arg_min Pe(Tsi-1)

the BER can be given as-

Pe(T, 5;-1)= 1 = Pe(5;-1, T) 2 -1 5;-2,-;5;-1

=> Optimal K-Bit Memory Receiver

This setup yields the copfinal performance but needs more a price information on the previously detected of which increases the complexity.



 $\frac{1}{5i} = \frac{50}{5}$ $\frac{1}{5} = \frac{50.5}{5}$ whose the threeshood of accounts from the fac > One-Bit Memcony Roceiver: In this type the input of the ANN is not Just the number of societies at the ith time slot is but also the estimated Symbol at the Ci-Dth fime slot Si-1 5i = 50, $P(5i = 1 | a_i, 5i - 1) < 0.5$ K-Bit Memoery Receiver. By using the same method as the one-bit memory seceiver the decision sule can be formulated as. 5;=90, P(s;=1 &i, s;-1, --, si-k) <0.5 1, P(s;=1 &i, s;-1, --, si-k) >0.5