1997 Paper 7 Question 7

Neural Computing

Illustrate how stochasticity can be used in artificial neural networks to solve, at least in an asymptotic sense, problems that would otherwise be intractable. Name at least *two* such stochastic engines, describe the rôle of stochasticity in each, and identify the kinds of problems that such artificial neural devices seem able to solve.

[10 marks]

Illustrate the evidence for stochasticity in natural nervous systems, and comment on the rôle that it might play in neurobiological function. What is the case supporting John von Neumann's deathbed prediction that stochasticity might be a computational engine for the nervous system, rather than just random noise? Describe at least one experiment involving neural tissue in support of this theory.

[10 marks]