In the area of finding performance bounds on the nonlinear filtering problem the information rate between the signal at time $t$ and the observation process up to time $t$ has been evaluated for the general discrete time nonlinear filtering problem. This information rate allows a general definition of steady...
20. Abstract continued.

state new stronger lower bounds for the filtering error are derived.

In the area of building nonlinear filter the estimate production speed of the two dimensional phase demodulation problem on the Cray 1 is being improved by examining the assembly code generated by the Cray 1 compiler and seeking to improve the running time by changing the Fortran code on the basis of these observations. This latter problem has been extensively investigated on the CDC 7600 and the Star 100, which in fact has lead to increased understanding of some of the architectural design constraints inherent in the use of these machines on problems requiring large memories (i.e. over 200K decimal).
Personnel Supported

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Research Summary

In the area of finding performance bounds on the nonlinear filtering problem, we have recently (2) evaluated the information rate between the signal at time t and the observation process up to time t for the general discrete time nonlinear filtering problem. This information rate allows a general definition of steady state (i.e. when it vanishes) for the general nonlinear filtering problem. Further in steady state new stronger lower bounds for the filtering error are derived. In the special case of (1) stronger results are generated.

In the area of building nonlinear filters, we are currently seeking to improve the estimate production speed of the two dimensional phase demodulation problem on the Cray I by examining the assembly code generated by the Cray I compiler and seeking to improve the running time by changing the Fortran code on the basis of these observations. We would like to look at the combined phase amplitude problem on the Cray, but lack computer time at present.

This latter problem has been extensively investigated on the 7600 and the Star 100, which in fact has lead to increased understanding of some of the architectural design constraints inherent in the use of these machines on problems requiring large memory requirements (i.e. over 200 K decimal). These results are reported in (1) and (3).
Papers Appearing


Papers Submitted


(2) R. S. Bucy "Information and Filtering", submitted Information Sciences.