ISDL SEMINAR

THE EFFECTS OF CLOCK SKEW ON THE CONVERGENCE AND STABILITY OF CERTAIN NONLINEAR ITERATIVE ALGORITHMS

Professor Robert J. Marks II

Interactive Systems Design Laboratory
Dept. of Electrical Engineering

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EE Bldg., Room 108

ABSTRACT

Certain artificial neural network and signal restoration algorithms make use of iterations to converge to a desired solution. In certain asynchronous implementations of these algorithms, the presence of clock skew can result in either an unstable solution or a solution far different than that desired. We examine a class of such algorithms and show that if the synchronous algorithm includes a (possibly nonlinear) contractive operation in the feedback path, then, if the skewed iteration is stable, skew will not affect the steady state result. Stability criteria can also be established for such iterations. As examples, a number of optical processors that use feedback will be examined for their skew properties. Here, clock skew typically results from differing optical path lengths.

BIOGRAPHICAL INFORMATION

Dr. Marks joined the faculty of the Department of Electrical Engineering at the University of Washington, Seattle, in December of 1977 where he currently holds the title of Professor. He was awarded the *Outstanding Branch Councillor* award in 1982 by IEEE and, in 1984, was presented with an *IEEE Centennial Medal*. He is a Senior Member of IEEE. Prof. Marks is also Chair of the *IEEE Circuits & Systems Society Technical Committee on Neural Systems & Applications* and is Chairman pro tem of the *IEEE Neural Networks Committee* which coordinates all of the activities relating to neural networks in IEEE. He was a co-founder and first President of the *Puget Sound Section of the Optical Society of America* and was recently elected that organization's first honorary member. Dr. Marks has over eighty archival journal and proceedings publications in the areas of detection theory, signal recovery, optical computing and artificial neural processing. He is a member of Eta Kappa Nu and Sigma Xi. Bob is a good engineer and all round swell guy.

For more information about the seminar series, contact
Prof. Les E. Atlas or Prof. Robert J. Marks II
Interactive Systems Design Laboratory, FT-10
University of Washington
Seattle, WA 98195
(206) 545-1315 or (206) 543-6990