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## NBER COMPUTER RESEARCH CENTER NOTES

The NBER Computer Research Center for Economics and Management Science has been engaged, since its formation in 1971, in developing new software systems for quantitative social science research. New software for modeling of energy systems, sensitivity analysis of econometric models, Bayesian regression, robust estimation, and mathematical programming are in various stages of design and implementation. Virtually all of the Computer Research Center's systems are interactive.

The TROLL system was the principal environment for the Computer Research Center's research and development through January 1976. TROLL now provides a wide range of econometric, data-analysis, and numerical-analysis subsystems; these are available to the academic research community via a data-communication network that links the NBER's computer facility with "nodes" in over forty cities in the U.S.A. Over thirty manuals describing TROLL and its subsystems are available. Request the complimentary "TROLL Bibliography" (address below).

Other Computer Research Center systems, available or under development, include:

**FIXPOINT:** performs fixed-point (simplicial) approximation using the method of H. Scarf.

**ACOS:** an operating system designed to support the development and use of interactive programs for quantitative research. Features a language for specifying the user interface of application subroutines.

**DASEL:** a language for programming mathematical and statistical algorithms. Features APL-like capabilities plus the use of multi-dimensional arrays as the basic data type.

ACOS and DASEL are now being used at the Computer Research Center in the development of an energy-modeling system. This system is intended to provide the computational and data-management capabilities needed for current energy-modeling research—including a capability for linking econometric and optimization models.

For information about using the Computer Research Center's systems, as well as for documentation, please write to:

Support Staff Manager  
NBER Computer Research Center for  
Economics and Management Science  
575 Technology Square  
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*Following are the abstracts of two recent working papers of the NBER Computer Research Center. The complete texts are available for \$1.50 per copy (address above)*

Hsiao, C., and P. M. Robinson. "Efficient Estimation of a Dynamic Error-Shock Model," NBER Working Paper 157 (November 1976).

This paper is concerned with the estimation of the parameters in a dynamic simultaneous equation model with stationary disturbances under the assumption that the variables are subject to random measurement errors. The conditions under which the parameters are identified are stated. An asymptotically efficient frequency-domain class of instrumental variables estimators is suggested. The procedure consists of two basic steps. The first step transforms the model in such a way that the observed exogenous variables are asymptotically orthogonal to the residual terms. The second step involves an iterative procedure like that of Robinson.

Simeone, B.. "A Conic Algorithm for the Group Minimization Problem," NBER Working Paper 159 (December 1976).

A new algorithm for the group minimization problem (GP) is proposed. The algorithm can be broadly described as follows. A suitable relaxation of (GP) is defined, in which any feasible point satisfies the group equation but may have negative components. The feasible points of the relaxation are then generated in order of ascending costs by a variant of a well-known algorithm of Glover, and checked for non-negativity. The first non-negative point is an optimal solution of (GP).

Advantages and disadvantages of the algorithm are discussed; in particular, the implementation of the algorithm (which can be easily extended so as to solve integer linear programming problems) does not require group arithmetics.