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ABSTRACTS OF PAPERS

(*An abstract of a paper presented at the Western Regional meeting, Las Vegas, Nevada, March* 22–24, 1971. *Additional abstracts appeared in previous issues.*)

128-24. A nonlinear method of predicting and representing random variables. J. L. DENNY, University of Arizona.

We obtain several necessary and sufficient conditions for each nonnegative rv X to have a representation a.e. $\sum_1^n Y_i$, where each rv Y_i is nonnegative and measurable with respect to a fixed (in advance) sub-sigma-algebra. For example, one theorem characterizes those probabilities on R^2 which assign measure one to the graphs of two real-valued Borel functions. The conditions of the representation theorem are used to obtain sufficient conditions for convergence of a nonlinear method of prediction which depends on convergence properties of iterated conditional expectation operators. (Received February 15, 1971.)

(*Abstracts of papers presented at the Eastern Regional meeting, University Park, Pennsylvania, April* 21–23, 1971. *Additional abstracts appeared in earlier issues.*)

129-13. On some properties of a regular sequence of designs and asymptotically optimal design in time series. MARK C. K. YANG, University of Florida.

A regular sequence of designs generated by a probability density function is found to be useful in discrete time point design of a continuous time series. This paper generalizes Sacks and Ylvisaker's results in *Ann. Math. Statist.* [I (1966) page 66, II (1968) page 49, III (1970) page 2057] to two possible regression models $y(t) = \sum_{j=1}^n \alpha_j f_j(t) + N(t)$ and $y(t) = \sum_{j=1}^m \beta_j f_j(t) + N(t)$ $t \in [0, 1]$, where $N(t)$ is a stationary time series with mean function zero and a known covariance function. It can be shown that there exists a probability function h^* defined on [0, 1] such that the regular sequence of designs generated by h^* is asymptotically optimal for estimating both α's and β's. A nonlinear programming method of finding h^* is also obtained. (Received February 10, 1971.)

129-14. Convergence of sequences of regular functionals of empirical distributions to processes of Brownian motion. P. K. SEN, University of North Carolina.

For partial cumulative sums of independent and identically distributed random variables with zero mean and a finite (positive) variance, weak convergence to Brownian motion processes has been established by Donsker [see Billingsley: *Convergence of Probability Measures*, Wiley, New York (1968) 68]. The result is extended here to differentiable statistical functions of von Mises [*Ann. Math.*