

for a beginner. This book is an important and valuable addition to a growing secondary literature, which is perhaps best absorbed by wandering back and forth from one book to another and thence to the primary sources as quickly as possible.

We wish to add our thanks and compliments to J. N. Crossley for translating this work into (very readable) English.

#### REFERENCES

1. J. Bridge, *A simplification of the Bachmann method for generating large countable ordinals*, J. Symbolic Logic **40** (1975), 171–185.
2. W. Buchholz, *Eine Erweiterung der Schnitteliminations methode*, Habilitationsschrift, Ludwig-Maximilians-Universität, München, 1977.
3. S. Feferman, *Formal theories for transfinite iterations of generalized inductive definitions and some subsystems of analysis*, Intuitionism and Proof Theory, North-Holland, Amsterdam, 1970, pp. 303–325.
4. ———, Review of [12], Bull. Amer. Math. Soc. **83** (1977), 351–361. (Note: [F2] of the references of [4] has now appeared in the *Handbook of mathematical logic* (J. Barwise, ed.), North-Holland, Amsterdam, 1970, pp. 913–971.)
5. H. Friedman, *Iterated inductive definitions and  $\Sigma_2^1$ -AC*, Intuitionism and Proof Theory, North-Holland, Amsterdam, 1970, pp. 435–442.
6. J.-Y. Girard, *Three-valued logic and cut-elimination: the actual meaning of Takeuti's conjecture*, Dissertationes Math. **136** (1976).
7. W. Pohlers, *Beweistheorie der iterierten Induktiven Definitionen*, Habilitationsschrift, Ludwig-Maximilians-Universität, München, 1977.
8. K. Schütte, *Beweistheorie*, Springer-Verlag, Berlin, 1960.
9. W. Sieg, *Trees in metamathematics: theories of inductive definitions and subsystems of analysis*, Dissertation, Stanford Univ. 1977.
10. S. Stenlund, *Combinators,  $\lambda$ -terms and proof theory*, Reidel, Dordrecht, 1972.
11. W. W. Tait, *Infinitely long terms of transfinite type*, Formal Systems and Recursive Functions (Crossley and Dummett, eds.), North-Holland, Amsterdam, 1965, pp. 465–475.
12. G. Takeuti, *Proof theory*, North-Holland, Amsterdam, 1975.
13. A. S. Troelstra (Editor), *Metamathematical investigation of intuitionistic arithmetic and analysis*, Lecture Notes in Math., vol. 344, Springer-Verlag, Berlin, 1973.

SOLOMON FEFERMAN

BULLETIN (New Series) OF THE  
 AMERICAN MATHEMATICAL SOCIETY  
 Volume 1, Number 1, January 1979  
 ©American Mathematical Society 1979  
 0002-9904/79/0000-0010/\$01.75

*Linear estimation and stochastic control*, by M. H. A. Davis, Wiley, New York, 1977, xii + 224 pp., \$14.95.

In this monograph the author gives a highly readable introduction to two topics, namely the Kalman filter and the stochastic linear regulator problem. These two topics have been called the “bread and butter” of modern stochastic systems theory. They have the fortunate feature that the mathematical techniques used are elegant, while at the same time the results have been quite widely used in engineering and other applications. Rather modest background is needed to read the book. The equivalent of introductory real-analysis, probability, and some familiarity with elementary linear systems theory should suffice.

The linear estimation problem is as follows. Given random variables  $X_s, Y_s$  for  $s \in S$ , all of zero mean and finite variance, find the approximation  $\hat{X}_s$  to  $X_s$