G. David Forney Jr. received a B.S.E. degree in electrical engineering from Princeton University, in 1961, and M.S. and Sc.D. degrees in electrical engineering from the Massachusetts Institute of Technology, in 1963 and 1965, respectively.

From 1965-99 he worked for the Codex Corporation, which was acquired by Motorola, Inc. in 1977, and its successor, the Motorola Information Systems Group. Since 1996, he has been Bernard M. Gordon Adjunct Professor at M.I.T.

Dr. Forney was editor of the IEEE Transactions on Information Theory from 1970 to 1973. He was a member of the Board of Governors of the IEEE Information Theory Society during 1970-76 and 1986-94, and was President in 1992. He has been awarded the 1970 IEEE Information Theory Group Prize Paper Award, the 1972 IEEE Browder J. Thompson Memorial Prize Paper Award, the 1990 IEEE Donald G. Fink Prize Paper Award, the 1992 IEEE Edison Medal, the 1995 IEEE Information Theory Society Claude E. Shannon Award, the 1996 Christopher Columbus International Communications Award, and the 1997 Marconi International Fellowship. In 1998 he received an IT Golden Jubilee Award for Technological Innovation, and two IT Golden Jubilee Paper Awards. He was elected a Fellow of the IEEE in 1973, a member of the National Academy of Engineering (U.S.A.) in 1983, a Fellow of the American Association for the Advancement of Science in 1993, an honorary member of the Popov Society (Russia) in 1994, a Fellow of the American Academy of Arts and Sciences in 1998, and a member of the National Academy of Sciences (U.S.A.) in 2003.

Not your father's coding theory

A generation ago, "coding theory" was usually understood to mean the theory of algebraic block codes and their algebraic decoding algorithms, although other kinds of codes and decoders, such as convolutional codes and the Viterbi algorithm, were often used in practical digital communication systems.

In the past decade, a revolution has taken place. "Turbo codes" and other classes of capacity-approaching codes now approach the Shannon limit very closely, with reasonable decoding complexity. Theoretical and practical attention has shifted to these new classes of codes.

This presentation will introduce the underlying theory of these new codes and their decoding algorithms: namely, the theory of "codes on graphs." The roots of this subject will be seen to lie in convolutional codes and other classes of "probabilistic" codes and decoders that were known long ago, but that have become widely appreciated only recently.