

## Citation

Seminal research in information coding theory and data compression, and enormous contributions to the promotion of diversity in engineering education



## Dr. Robert M. Gray

### Position and Organization :

Alcatel-Lucent Technologies Professor of Communications and Networking in the School of Engineering, Stanford University, Emeritus

**Degree :** Ph.D. (1966, University of Southern California (USC))

**Date of Birth :** November 1, 1943

### Brief Biography :

- 1966 BS, MS (Electrical Engineering), MIT
- 1969 Ph.D. (Electrical Engineering), USC  
Lecturer, USC  
Assistant Professor, Department of Electrical Engineering, Stanford Univ.
- 1975 Associate Professor, Stanford Univ.
- 1980 Professor, Stanford Univ.
- 1984 Director, Information Systems Laboratory, Stanford Univ.
- 2004 Lucent Technologies Professor of Communications and Networking in the School of Engineering, Stanford Univ.
- 2008 Research Fellow, Michelle R. Clayman Institute for Gender Research, Stanford Univ.
- 2011 Alcatel-Lucent Technologies Professor of Communications and Networking in the School of Engineering, Stanford Univ., Emeritus
- 2014 Research Professor, Department of Electrical and Computer Engineering, Boston Univ.

### Main Awards and Honors:

- 2002 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring
- IEEE Info. Theory Society
- 1998 Golden Jubilee Award for Technological Innovation
- 2008 Claude E. Shannon Award
- 2020 Aaron D. Wyner Distinguished Service Award
- IEEE Signal Processing Society
- 1983 Senior Award
- 1993 Society Award
- 1997 Technical Achievement Award
- 2005 Meritorious Service Award
- 2009 Education Award
- IEEE
- 1984 Centennial Medal
- 2000 Third Millennium Medal
- 2009 Jack S. Kilby Signal Processing Medal

Member of the National Academy of Engineering,  
Elected Fellow of the IEEE,  
Elected Fellow, Institute for Mathematical Statistics

### Main Achievements :

Dr. Robert M. Gray received his B.S. and M.S. from the Massachusetts Institute of Technology in 1966 and his Ph.D. from the University of Southern California in 1969.

The same year, he started working in the Department of Electrical Engineering at Stanford University where he became a Professor Emeritus in 2011. During that time, he has held a variety of key positions, including Director of Stanford University's Information Systems Laboratory, and has been involved in research and education in information theory, communication theory, signal processing, and probability theory.

Dr. Gray has been conducting research on theories of information source coding and has made leading achievements in applying them to the actual problems of information and communications, especially to information compression. He and his students conceived of vector quantization as a block code that gives extremely high performance, especially in information source coding. The LBG algorithm, which he proposed in 1980 with Dr. Linde and Dr. Buzo, has been applied to information sources such as audio and still images, enabling highly efficient information compression. Since then, researchers around the world have applied vector quantization to a variety of information sources including voice and video. He has been awarded the IEEE Information Theory Society's Claude E. Shannon Award for his achievements, and is an Elected Fellow of the IEEE, an Elected Fellow of the Institute for Mathematical Statistics, and a Member of the National Academy of Engineering.

Dr. Gray has supervised 56 successful Ph.D. students, including 17 women, 7 of whom became tenured professors at major universities, including the California Institute of Technology, the University of California, and Washington University. In 2002 he received a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM) "for embodying excellence in mentoring underrepresented students and encouraging their significant advancement in science, mathematics and engineering."

In 2013 Dr. Gray received the Stanford University President's Award for Excellence through Diversity.

In recognition of his achievements in original research in information source coding theory and data compression and his great contributions to the promotion of diversity in engineering, Dr. Robert M. Gray is hereby awarded the Okawa Prize.