



Terrence L. Fine

March 9, 1939 – January 31, 2021

Professor Terrence (Terry) L. Fine passed away on January 31, 2021 at the age of 81. Terry was born in New York City on March 9, 1939 to Lola Breidberg and Abraham Fine. He received the B.E.E. ('58) from City College of New York, the S.M. ('59) and Ph.D. ('63) from Harvard University. In 1964, he was awarded a Miller Institute Junior Research Fellowship at the University of California at Berkeley where he remained until he came to Cornell's School of Electrical Engineering in 1966.

Terry served on the faculty of the School of Electrical and Computer Engineering from 1966 until 2010. While at Cornell, he supervised 21 Ph.D. students, all of whom he worked with closely. Terry was very passionate about ECE student support and the evolution of the ECE curriculum. He excelled in conducting research, teaching, and providing professional service until his retirement in 2010.

Terry's research started with his Ph.D. dissertation work on statistical delta modulation. About 20 years later, this research and a subsequent paper became half of a 1986 monograph entitled *Recursive Source Coding: A theory for the practice of waveform coding*, authored by G. Gabor and Z. Györfi for Springer, where it was referred to as the "Fine-McMillan Recursive Quantizer."

Some of Terry's earliest research at Cornell attempted to develop axiomatic approaches to estimation and inference when too little is known at the outset to plausibly make a statistical model. This led to the dissertation of Terry's first Ph.D. student.

The enduring theme of Terry's research career was the foundations of probability, by which is meant a variety of interpretations/ meanings (objective physical, subjective, epistemic-knowledge based) for probability, and more controversially, a variety of mathematical structures, especially ones that do not commit us to treating probability as a real number. He was particularly critical of suggestions that people approached notions of probability in a Bayesian

manner. This work culminated in his most frequently cited work, his text *Theories of Probability: An Examination of Foundations*, published in 1973 by Academic Press.

In the period from 1989 through 1999, Terry became involved with statistical questions central to the then burgeoning field of artificial neural networks. This research led to several publications and conference presentations at NIPS, now NeurIPS, and several Ph.D. dissertations on both theoretical and applied questions involving neural networks. This work culminated in his book *Feedforward Neural Network Methodology*, published in 2006 by Springer.

An attempt to use the techniques of neural networks to increase the service capacity of cellular wireless networks resulted in a U.S. patent, with Stephen Wicker, on sensor-assisted ALOHA networks.

Terry provided immense service to his profession. He served as president of the IEEE Information Theory Group (1988-89), now the IEEE Information Theory Society, and as associate editor for the *IEEE Transactions on Information Theory* (1979-81 and 1985-87). He was a member of the Administrative Committee and frequent reviewer for the *IEEE Transactions on Neural Networks*. Terry was a founding member of Neural Information Processing Society (NIPS) administrative Board of Directors. He was a member of the Society for Imprecise Probability: Theories and Applications (SIPTA) since its founding in 2002 until 2009.

Terry provided outstanding and sustained service to the school, college, and university through his membership on, and leadership of, a wide variety of committees. Since its founding in 1973, Terry was elected chair of the ECE Policy Committee more often than any other faculty member. On the ECEPC, he was a steady proponent of responsible faculty direction of all aspects of the life of the school and urged informed involvement and consistency in actions taken.

Department faculty meetings were almost always energized by Terry's strong advocacy or opposition of the issue under discussion. He was rarely neutral! He presented principled arguments to support his positions, and in this way helped the school develop a tradition of discussion and debate on all issues. From 2008 to 2010, Terry served ECE as its associate director. The associate director has the primary administrative responsibility for all aspects of the teaching program, including faculty teaching assignments, academic actions involving students, and evolution of the curriculum.

In the spring of 1999, Terry was asked by Vice Provost for Research, Bob Richardson, to serve as director of the Cornell Center for Applied Mathematics (CAM). He served in this role from 1999-2004, having been appointed for a second term. His service ended prematurely in 2004 due to severe illness. During his tenure as director, CAM had its largest graduate student enrollment.

He chaired the College's Engineering Policy Committee on at least two occasions, served on numerous ad hoc promotion committees, served on and chaired the Nominations Committee, and served on the Academic Integrity Hearing Board.

At the University level, Terry served for decades on many standing committees and chaired a

number of them that provided leadership for the University Faculty. He also chaired the Committee on Academic Freedom and the Professional Status of the Faculty, and he served on FACTA. Terry was a member of all of the various forms of University Faculty governance starting with the Constituent Assembly created in response to the crisis of April 1969. With an exception for severe illness, he was a member of the current Faculty Senate from its inception until the time of his retirement. Terry also served on the University Faculty Committee, which is the executive committee of the Faculty Senate.

Terry taught an array of courses during his tenure at Electrical and Computer Engineering. He was the creator of several courses that are still being taught by our faculty, such as ECE 3100, 3250, and 4110. Terry's teaching efforts were recognized by his being selected by a 1990 Merrill Presidential Scholar as an "Outstanding Educator," the "Ruth and Joel Spira Excellence in Teaching Award" in ECE for 1998-1999, and the College "Fiona Ip and Donald Li" and the "Douglas Whitney" Excellence in Teaching Awards in 1996 and 2002, respectively. It is estimated that he taught more than 2500 students during his teaching career at Cornell.

Terry Fine will be remembered for his outstanding contributions to teaching, professional service, his research, and especially for his principled and energetic engagement with his colleagues on all issues facing the faculty. He was an ideal colleague and mentor for ECE faculty, students and the University at large.

Written by Clifford Pollock (Chair), Aaron Wagner, and Stephen Wicker