

## Short Biography

Subhash Kak is Regents Professor in the School of Electrical and Computer Engineering at Oklahoma State University in Stillwater.

Born in Srinagar, Kashmir, he was educated in various places in Jammu and Kashmir. He completed his Ph.D. in Electrical Engineering from Indian Institute of Technology, Delhi. During 1975-1976, he was a visiting faculty at Imperial College, London, and a guest researcher at Bell Laboratories, Murray Hill. In 1977, he was a visiting researcher at Tata Institute of Fundamental Research, Bombay. During 1979-2007, he was with Louisiana State University, Baton Rouge where he served as Donald C. and Elaine T. Delaune Distinguished Professor of Electrical and Computer Engineering. He has also served as Professor at Curtin University, Perth, Australia.

His research has spanned the fields of information theory, cryptography, neural networks, and quantum information. He developed the theory of d-sequences for applications to computing and cryptography and he has worked on a variety of problems on data and network security. He is the inventor of a family of instantaneously trained neural networks (for which he received a patent) for which a variety of artificial intelligence applications have been found. He has argued that brain function is associated with three kinds of language: associative, reorganizational, and quantum.

He was the first to look for information metric for a quantum state over thirty years ago. His work on quantum information includes the only all-quantum protocol for public-key cryptography. He has also contributed to quantum computing and proposed a new measure of information for quantum systems. He has also shown how biological memories could have a quantum basis and he has obtained new Bell-type inequalities for quantum mechanics. This work as well as his proposed resolution of the twin paradox has received considerable attention in the popular press.

His other technical contributions include: the first formulation of the discrete Hilbert transform, sampling theorem for Walsh analysis, permutation based speech scrambling, first proposal for joint encryption and error correction coding, the idea of secret-hardware public key cryptography, a proposal for “molecular computing”, an independent proposal for a marked-up language for NLP, a two-layered mesh array for matrix multiplication, self-indexing of neural memories, the idea of recursive cryptography, the use of Pythagorean triples in cryptography, and the number-theoretic Hilbert transform.

He has written on science for the general public and his work has been showcased in the popular media including Discovery and History channels, PBS, Dutch Public TV, and in a documentary on music ([www.ragaunveiled.com](http://www.ragaunveiled.com)). He has written on philosophy of mind and shown how recursion plays a fundamental role in art, music and aesthetics.

Applying cryptographic theory to the study of ancient scripts, he showed that on probabilistic grounds the Indus script must be the originator of the later Brahmi script. He also found a long-forgotten astronomy of the ancient world that has been called “revolutionary” and “epoch-making” by scholars and which has had considerable influence on archaeoastronomy and the understanding of the rise of science in the ancient world. In 2008-2009, he was appointed one of the principal editors for the ICOMOS project of UNESCO for identification of world heritage sites.

He is the author of 12 books which includes "The Architecture of Knowledge." He is also the author of 6 books of verse. These books have been translated into French, German, Italian, Spanish, Korean, and Serbian.

Amongst his awards are British Council Fellow (1976), Science Academy Medal of the Indian National Science Academy (1977), Kothari Prize (1977), UNESCO Tokten Award (1986), Goyal Prize (1998), National Fellow of the Indian Institute of Advanced Study (2001), and Distinguished Alumnus of IIT Delhi (2002).