

Virtual Spaces: From the Past to the Future

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Introduction

Space can be seen in many different ways. When an architect and a computer scientist look at space they see very different things and yet sometimes they make surprisingly similar discoveries. As a computer scientist with strong research interests in visual languages I learned many things from the theory and practice of architecture. This lecture on virtual spaces is motivated by a desire to share these findings.

We begin by discussing the origins of architectural pleasure and how the space of a dwelling can be divided into refuge and prospect according to Grant Hildebrand. This decomposition of space leads us naturally to consider spatial relations and patterns. On the pragmatic side we illustrate patterns by the works of Frank Lloyd Wright. On the theoretical side we consider Christopher Alexander's theory of patterns and its relationship to the theory of visual languages and software engineering. After a discussion of William Mitchell's e-topia as an example of the V-topia, the virtual cities of the past, the present and the future are surveyed.

Biographical Sketch

Dr. Chang received the B.S.E.E. degree from National Taiwan University in 1965. He received the M.S. and Ph.D. degrees from the University of California, Berkeley, in 1967 and 1969, respectively. He was a research scientist at IBM Watson Research Center from 1969 to 1975. From 1975 to 1982 he was Associate Professor and then Professor at the Department of Information Engineering, University of Illinois at Chicago. From 1982 to 1986 he

was Professor and Chairman of the Department of Electrical and Computer Engineering, Illinois Institute of Technology. From 1986 to 1991 he was Professor and Chairman of the Department of Computer Science, University of Pittsburgh. He is currently Professor and Director of the Center for Parallel, Distributed and Intelligent Systems, University of Pittsburgh. Dr. Chang is a Fellow of IEEE. He published over 230 papers and 16 scientific books. He is the founder and co-editor-in-chief of the international journal, Visual Languages and Computing, published by Academic Press, the editor-in-chief of the international journal, Software Engineering & Knowledge Engineering, published by World Scientific Press, and the co-editor-in-chief of the international journal on Distance Education Technologies. Dr. Chang pioneered the development of Chinese language computers, and was the first to develop a picture grammar for Chinese ideographs, and invented the phonetic phrase Chinese input method.

Dr. Chang's literary activities include the writing of over thirty novels, collections of short stories and essays. He is widely regarded as an acclaimed novelist in Taiwan. His novel, The Chess King, was translated into English and German, made into a stage musical, then a TV mini-series and a movie. It was adopted as textbook for foreign students studying Chinese at the Stanford Center (Inter-University Program for Chinese Language Studies administered by Stanford University), Taipei, Taiwan. In 1992, Chess King was adopted as supplementary reading for high school students in Hong Kong. The short story, "Banana Boat", was included in a textbook for advanced study of Chinese edited by Neal Robbins and published by Yale University Press. University of Illinois adopted "The Amateur Cameraman" in course materials for studying Chinese. Dr. Chang is also regarded as the father of science fiction in Taiwan. Some of Dr. Chang's SciFi short stories have been translated into English, such as "City of the Bronze Statue", "Love Bridge", and "Returning". His SciFi novel, The City Trilogy, will be published by Columbia University Press in May 2003.