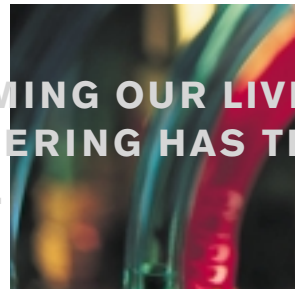
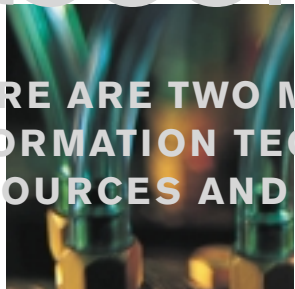


accelerating the future

THERE ARE TWO MAJOR TECHNICAL FIELDS THAT ARE RAPIDLY TRANSFORMING OUR LIVES—
INFORMATION TECHNOLOGY AND BIOMEDICAL TECHNOLOGY. USC ENGINEERING HAS THE
RESOURCES AND THE PEOPLE TO MAKE SIGNIFICANT ADVANCES IN BOTH.



RESEARCH AND GRADUATE EDUCATION

university of southern california
school of engineering

junior faculty profile

ELAINE CHEW
DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING



Concert pianists and industrial engineers don't seem to go hand-in-hand at first glance, but Elaine Chew, assistant professor of Industrial & Systems Engineering, has managed to combine both her training as an operations researcher and her experience as a practicing musician into the field of computer modeling.

Chew is applying the science of decision making (operations research) to the domain of music. She considers it the ideal domain in which to study human perception and cognition, communication and creativity. Any musical performance is the result of a series of decisions through a complex decision space. How can mathematical models of this decision space be created; how can the performer's decision trajectories be mapped, monitored and predicted in real time; these are some of the questions Chew hopes to answer by understanding the interaction among perception, cognition, decision-making and communication in music performance.

Growing up in Singapore, Chew was an award-winning pianist by the time she was in her teens, yet she also knew that teaching was her calling. She went on to major in both computational mathematics and music at Stanford, where she was awarded an undergraduate research fellowship to work with George Dantzig. While earning her Ph.D. at MIT she was engaged in computational finance research in portfolio optimization and on the staff of Music and Theater Arts. It was as a piano lab instructor that she discovered novel mathematical and algorithmic ways to explain keyboard playing to engineering students enrolled in theory and composition classes. Her dissertation on a mathematical model for tonality led to more precise and efficient real-time computer algorithms for key-finding, a fundamental problem in music.

In addition to recently joining the Department of Industrial and Systems Engineering, Chew is also a senior investigator at the Integrated Media Systems Center (IMSC). According to her, IMSC was one of the major attractions of USC Engineering. "The continuation of such highly non-traditional research requires imaginative leadership and an organizational infrastructure that fosters cross-disciplinary research and collaborations," she says, "I came to USC because I was convinced that my research could continue at IMSC and that my Industrial and Systems Engineering colleagues would consider it an asset."

A dedicated chamber musician, as well as a proponent of new music, Chew has worked with many prominent composers and is thrilled to be in the major culture center of Los Angeles. Her rendition of Ivan Tchernin's "Fêtes: 12 Variations on Happy Birthday" recently inspired a program of music by American composers based on familiar themes on NPR's "Art of the States" program, which will be broadcast worldwide.