

## MEMBER PROFILE: ELAINE CHEW

Elaine Chew is an Assistant Professor in the Epstein Department of Industrial and Systems Engineering at the University of Southern California Viterbi School of Engineering, where she is also a key investigator at the Integrated Media Systems Center. She received a B.A.S. in mathematical and computational sciences, and music at Stanford University, and S.M. and Ph.D. degrees in Operations Research from the Massachusetts Institute of Technology. Between Cambridge and Los Angeles, she spent a year at Lehigh University as a Visiting Assistant Professor.

Born in Buffalo, New York, Elaine grew up on a university campus in Singapore where her father, Chew Kim Lin, was founding president of the Operational Research Society of Singapore and founding editor of the Asia-Pacific Journal of Operations Research. As a second-generation operations researcher, she learnt from an early age that nothing was sacrosanct where mathematical modeling was concerned; everything from Rubik's cube to organizing furniture in a new home was approached analytically with mathematical equations. Upon her father's advice she opted for mathematical and computational sciences (instead of pure mathematics) at Stanford, an interdisciplinary degree between the departments of mathematics, statistics, computer science and operations research. As an undergraduate, she did a summer research project with George Dantzig, where she implemented and tested an interior point method proposed by Von Neumann.

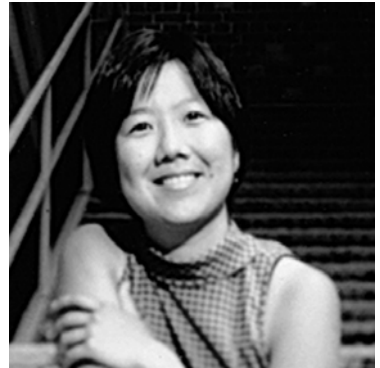
Thus, equipped with some OR knowledge and computational experience, she enrolled at MIT's Operations Research Center on an Office of Naval Research graduate fellowship. The fellowship gave her the opportunity to explore projects in a variety of different areas, namely, mathematical programming, and the then emerging fields of

computational biology and computational finance. However, it was while she was teaching pianolab, the basic piano skills requirement for MIT students enrolled in music theory and composition courses, as an Affiliated Artist of Music and Theater Arts that it dawned on her that

it was quite natural and reasonable to describe and explain music in mathematical terms and that she might be able to make a highly enjoyable and fulfilling career of it. Her Ph.D. thesis completed under the supervision of Jeanne Bamberger, with OR co-advisor Georgia Perakis, proposed a mathematical model for tonality, the system of relations that serves as a framework for our hearing of tonal music, and computational methods for abstracting tonal structures. Her Spiral Array model and the algorithms introduced an "interior point" approach to the problem of key finding in computational music cognition.

A year after graduation, she was recruited by the University of Southern California's Epstein Department of Industrial and Systems Engineering to forge a link between the department and the Integrated Media Systems Center. There, her foray into mathematical modeling of music flourished and expanded to include collaborative projects in music information retrieval, distributed immersive performance and musical expression synthesis. She also developed a course on computational methods for music perception and cognition, the contents of which she has put online in the spirit of MIT's OpenCourseWare, for which she was one of the early contributors while working for Dick Larson as a research assistant.

Apart from creating computer models to analyze and manipulate music, Elaine also performs frequently as an articulate proponent of post-tonal music. Her performances can be heard on NPR and WGBH's *Art of the States* program. Her musical adventures include collaborations with colleagues Dennis Thurmond and Chris Kyriakakis at USC to create *Flying Sonics* – a tale of immersive audio and diverse instruments, a concert integrating live performers, electro-acoustic compositions and state-of-the-art immersive audio, and with long-time violinist friend Julia Ogyrdziak to present *Dark Blue Sky Dream*, a multimedia concert at the Ask Jeeves Planetarium in Oakland's Chabot Space and Science Center.



Elaine Chew (on left) in Rehearsal with Flying Sonics

In 2004, she was honored with an NSF Career award for her proposal on performer-centered approaches to computer-assisted music making, in which she stated that her purpose was “to establish engineering music research as a core academic discipline” and to “promote the use of computational research in music processing by humans as a basis for creating and improving human-computer interaction in computer music systems.” She has presented research papers at international conferences on Music Information Retrieval, Music and Artificial Intelligence, Sound and Music Computing, and Computer Music Modeling and Retrieval, and at the INFORMS Computing Society meetings; she has published in Springer Verlag’s Lecture Notes in Computer Science and Operations Research / Computer Science Interfaces Series and has forthcoming publications in the Computer Music Journal and Computing in Musicology. She has organized special clusters at the INFORMS and the INFORMS Computing Society meetings, and is currently guest editing a special cluster of papers on music and computation for the INFORMS Journal on Computing. She has been a member of INFORMS since 1992.



*Participants of the special sessions on Music, Computation and AI at the ICS Conference. From the left: Ozgur Izmirlir, Judy Franklin, Anja Volk, Chris Raphael, Elaine Chew, and Ching-Hua Chuan*

## AMENDMENTS TO ICS BYLAWS APPROVED

At the ICS Business Meeting in Annapolis (January 5, 05) the membership approved changes to the ICS Bylaws. The resolution and its rationale are given below.

### Be it resolved that

1. The first sentence of Article IV Section 2 (Terms of Office) be changed from  
“[All terms begin at the conclusion of the fall ICS Business meeting.](#)”  
to  
“[All terms begin at the start of the calendar year following the election.](#)”
2. The last two sentences of Article IV Section 4 (voting) be changed from  
“[Ties in any of these elections are broken by a vote taken at the spring ICS Business Meeting. The election process must be completed before this meeting takes place.](#)”  
to  
“[The election process must be completed within 6 weeks following the Fall Business Meeting. Ties in any of these elections are broken by a run-off vote to be completed within 6 weeks of these elections.](#)”
3. Note 1 of Article 4 be deleted.

Note: The existing ICS Bylaws can be found at [http://mason.gmu.edu/~asofer/ics/bylaws\\_frame.html](http://mason.gmu.edu/~asofer/ics/bylaws_frame.html)

### Rationale for Amendments

Section 3 of Article IV (Nominations) stipulates that "...The Chair shall also take nominations from the floor during the ICS fall Business Meeting..." Section 5 of Article IV (Election Process) stipulates that “Ballots shall be issued by one of the following media: a) letter mail ballot; b) electronic mail; c) a combination of letter mail and electronic mail ballots.” Combined, these stipulations imply that the balloting cannot be completed by the conclusion of the fall ICS Business meeting, and hence terms of elected officers cannot begin at that time.

In addition the existing mechanism for breaking ties by a vote at the spring ICS Business Meeting is not practical since the Society no longer holds Business Meetings **each** spring.

The proposed amendments (1) and (2) guarantee that balloting will occur in a timely fashion after the Fall Business meeting, and provides a more practical timetable for the assumption of term by newly elected officers. The amendment also proposes a valid mechanism for breaking ties in elections.

Note 1 of Article 4 gives provisions for the Terms of Office for the years 2000 and 2001. These are no longer relevant hence the Note may be deleted as proposed in (3)