

About This Issue

With this issue, *Computer Music Journal* enters its 40th year of publication. Volume 10, Number 1, included an overview of the *Journal's* first decade; Volume 20 contained a "then and now" article by F. Richard Moore as well as a series of articles on the state of the art; and in Volume 30, Number 1, the *Journal's* founder, John Snell, reminisced about this publication's nascence. In keeping with those commemorations, we celebrate the newest turn of the decade in this issue, whose cover topic, "Listening Back, Listening Forward," plays upon the theme of the 2015 International Computer Music Conference (ICMC): "Looking Back, Looking Forward."

Our tweak to the ICMC's theme alludes to a passage in this issue's first article, which is a transcription of Carla Scaletti's inspired keynote speech at that conference. (Her speech is published here rather than in the conference proceedings, and it is freely downloadable at www.mitpressjournals.org/toc/comj/40/1.) Scaletti wonders why the sense of hearing is so underrepresented in the metaphors of human language. For example, why do we speak of visionaries but not "auditionaries"? Why do we "look" back or forward instead of "listen"? Her article offers a wide-ranging series of insights (inhearings?), reaching back into prehistory and mythology to characterize human social and technological development. She places the invention of software on a par with Prometheus's legendary bringing of fire to mortals—also noting, in relation to the conference theme, that Prometheus's name means "thinking forward," whereas that of his brother

Epimetheus, who opened Pandora's box, means "thinking back." Scaletti speculates that "people are driven to use software—just as humans had used language—to form ever-more-complex interactive networks of people and knowledge, almost as if we were genetically programmed to use every new technology for purposes of connecting with each other and extending the range of our distributed cognition." Her article uses her own biography, that of a composer and music software developer, as a lens through which to view (or an ear trumpet through which to hear?) some of the major technological milestones of recent decades. She asks her audience of computer musicians to share their own similar stories, citing recent research that demonstrates that nostalgia—looking back—can in fact enhance creativity. We invite readers to do so by writing to cmj-editor@mitpress.mit.edu, for possible publication as letters to the editor. (Please include "[CMJ] story" in the subject line and mention Scaletti's article in the letter itself.)

In the issue's second article, Georg Hajdu examines two seemingly opposite trends in music of recent decades: (1) a move away from notation and toward improvisation, and (2) the algorithmic creation of notated scores. The latter can, however, be generated in real time during a performance, such as one in which the musicians achieve "extreme sight-reading" (to use Jason Freeman's terminology; see *Computer Music Journal* 32:3). In that case, the scores are intentionally ephemeral, just as improvisation is. Thus, both trends lead Hajdu to the notion of "Disposable Music"

(which is the title of his article). His essay weaves a fabric from these two trends and others, drawing upon the thinking of a number of philosophers and media theorists. For Hajdu, the disposable score becomes a metaphor for the diminished role of the author in the digital age. As examples, he discusses his own compositions *Schwer...unheimlich schwer*, *Ivresse '84*, and *Swan Song*.

Andrew Milne has co-authored several articles in recent volumes of *Computer Music Journal*, usually in connection with tuning theory. His article in the present issue, co-authored by Roger Dean, considers rhythm instead of pitch. Unsurprisingly, though, the authors' approach is based on mathematical properties that were first explored in connection with pitch. Specifically, the authors investigate the rhythmic use of maximally even sets that are "well formed." In a pitch context, such sets include the "black-key" pentatonic scales, the major and natural minor scales, the chromatic scale, and certain microtonal scales. In a rhythmic context, such sets contain beats of two durations that are distributed in time as evenly as possible. Also, the well-formed rhythms are hierarchical, just as the major scale embeds a pentatonic scale and is itself embedded in a chromatic scale. As Easley Blackwood did with tuning theory, Milne and Dean propose a continuously variable ratio of two interval sizes—but instead of major and minor seconds, the intervals here are temporal, leading to some unusual and complex rhythmic patterns. The authors show mathematical outcomes of their approach,

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Front cover. Carla Scaletti and cactus. (Photo: Kurt Hebel. Transport buttons added by *Computer Music Journal*.)

Back cover. An illustration from the article by Georg Hajdu, depicting some of the compositional and notational processes for his piece *Schwer...unheimlich schwer*.

and then they describe their free computer application that facilitates experimenting with such rhythms and their transformations.

The article by Greg Surges, Tamara Smyth, and Miller Puckette derives from their ICMC 2015 presentation that won the Best Paper award. The authors are interested in “generative audio systems,” which is their term for generative music systems that operate entirely at the level of audio signal processing, as opposed to ones that operate on symbolic musical data and eventually produce sound. The particular type of generative audio system that the authors describe uses time-varying all-pass filters. Though the all-pass filter’s output, by definition, has the same magnitude spectrum as its input (with a frequency-dependent change in phase), rapidly changing

the coefficients (particularly at audio rates) in the time-invariant formulation can lead to an output power that is greater than the input power, meaning that the filter can become unstable and its gain can “explode.” The authors propose the use of a certain type of power-preserving all-pass filter having parameters and phase response characteristics similar to the time-invariant case, but shown to be better behaved when made time varying. Finally, the article presents various configurations of the time-varying all-pass filter in cascade and in feedback networks, with past filter output being used to modulate filter coefficients. These networks act as complex, generative oscillators whose self-organizing behavior can alternate between rapid chirps, steady tones, and noise.

The Reviews section contains an item that relates to the first article. In it, Silvia Matheus reports on the 2015 Kyma International Sound Symposium—Kyma being Carla Scaletti’s music software that we alluded to earlier, an application that has an avid band of followers. Our Reviews editor, Ross Feller, contributes his own review of a recent book about the early technical innovations in computer music that were accomplished at Stanford University. The issue ends as usual with announcements of various products relevant to the field.

We invite readers, after they have read this issue, to “listen forward” another decade and consider what intriguing developments in computer music may have transpired when *Computer Music Journal* celebrates its semicentennial.