A Tribute to David Wessel (1942-2014)[1]
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Photo by Adrian Freed, CNMAT

Our community has lost one of its most inspirational members. David Wessel, born in 1942, passed away on October 13, 2014 at his office in the Center for New Music and Audio Technologies at UC Berkeley. He was a major figure in the fields of computer music and music psychology and was one of IRCAM's pioneers in the late 1970s and the 1980s. David studied mathematics and experimental psychology at the University of Illinois and received a doctorate in mathematical psychology from Stanford in 1972 under the guidance of William Estes. His work on the perception and compositional control of timbre in the early 1970s at Michigan State University subsequently found many applications related to research in the area of audio descriptors and led to a musical research position at the Institut de recherche et coordination acoustique/musique (IRCAM) in Paris at the invitation of Pierre Boulez in 1976. He was instrumental in establishing at IRCAM an emphasis on research in psychoacoustics and the cognitive psychology of hearing that continues to this day. In 1979, he began reshaping the Pedagogy Department at IRCAM to link its scientific and musical sectors.

David lived on one of the oldest streets in Paris, rue Quincampoix, just a few dozen meters, but a world, away from the bustling plaza of the Pompidou Center. The ancient floors of his upper-story apartment were unsettlingly unstable, and moved beneath one's steps alarmingly. But neither this unexpected instability, nor the "clochards" sprawled at the doorway below, seemed to bother him in the slightest. He floated above inconveniences in a fashion that was surprising to others.

During the middle 80s, with the arrival of the Apple MacIntosh computer and the MIDI standard, which he introduced into IRCAM, David was one of the first to realize the future impact of the emerging personal-computing phenomenon that soon revolutionized computer music. Recognizing potential that others overlooked was a hallmark of his. In 1985, he established a new IRCAM department devoted to the development of interactive musical software for personal computers and leading to the development of Max, the first iconic sound-processing language, written by Miller Puckette. Whatever the circumstance, David's presence somehow seemed to work as oil on troubled waters, bringing together and making productive diverse views and personalities. As coordinator of the first and tenth International Computer Music Conferences (ICMC) in East Lansing, Michigan and Paris, respectively, Wessel contributed to the founding and structuring of that highly interdisciplinary community and ensured its strong link to the music psychology community. Indeed, his strong involvement with this latter community is attested to by his leadership role in it as second president of the Society for Music Perception and Cognition (1992-1995) and his organization of the third SMPC meeting in 1995 at UC Berkeley.

In 1988, David left IRCAM to take up a position as Professor of Music at the University of California, Berkeley where he became co-director of the Center for New Music and Audio Technologies (CNMAT), founded the

[1] This tribute draws from the many messages from friends and colleagues that circulated shortly after David's death, most notably from Jean-Baptiste Barrière, Bill Hartmann, Vijay Iyer, George Lewis, and Frank Madlener.

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year before by composer Richard Felciano, who had been inspired by his interactions with David at IRCAM. Felciano took the initiative (and the risk) of proposing the move to California. Wessel realized immediately that a somewhat "non-institutional" environment would better suit his ways and the community he envisioned building in California. CNMAT is situated at 1750 Arch Street, near the Berkeley campus. It was already a famous locale for new music recordings and salon-style concerts in the upper Bay Area, originally owned and operated by the baritone singer Thomas Buckner, a good friend.

There was an elevated irony in the process. After luring David away from the institutional certainties of IRCAM to the vagaries of the Berkeley Music Department (traditionally oriented towards musicological ideals, not those which motivated him), Felciano left the Department just as Wessel arrived, leaving him in a complex and also traditionally oriented departmental environment without cover. David had to—and of course eventually did—win over his colleagues to an understanding of his purposes. And in time he found there a fellow searcher in composer Edmund Campion who became co-director of CNMAT.

David was particularly interested in live-performance computer music in which improvisation plays an essential role. He collaborated in performance with a remarkably varied list of improvising composers including Thomas Buckner, Steve Coleman, Vinko Globokar, Vijay Iyer, Shafqat Ali Khan, Jin Hi Kim, George Lewis, Roscoe Mitchell, Pauline Oliveros, Laetitia Sonami, and Ushio Torikai, among others. He performed throughout Europe, North America and Asia with interfaces and strategies of his own design or adaptation.

Uncommonly open-minded and generous with his knowledge of the latest scientific and technological advances, he opened up innovative paths in a variety of domains throughout his career. His early work on timbre and sound synthesis resulted in a seminal chapter co-written with composer/researcher Jean-Claude Risset in the first two editions of *The Psychology of Music*, edited by Diana Deutsch. His interest in computer-aided improvisation led to work on real-time interaction with high-level control structures piloted by human gestures and embodying intelligent listening agents designed on the basis of music cognition research. His activities as a practicing, improvising composer drove the development not only of computer routines for controlling the synthesis of sound and musical structures, but also human-computer interfaces through which the musician could interact gesturally with these routines. One was his famous *Slabs* shown in the photo above. David's pioneering work in the areas of gesture interfaces and performer/machine interaction paved the way to the development of the New Instruments for Musical Expression (NIME) community.

When the ICMC held its 1986 meeting in The Hague, David was present at a performance by a fellow "outlier," Michel Waisvisz. One of us (Reynolds) was seated in the audience between Wessel and Salvatore Martirano (another pioneer in the arena of digital synthesis and novel interface concepts that worried the boundaries between the clarity of the binary specificity of digital processes and the analog power of physical gesture). Waisvisz's performance with "The Hands" decisively redefined, in its smoothly connected and multi-variable modulation of sound, what "gestural control" could mean. The electricity in the air that night is unforgettable.

The Open Sound Control (OSC) format, designed for inter-application communication of structured data over networks, was invented at CNMAT by Adrian Freed and Matt Wright with significant input from David and has become a widely adopted standard for musical and audio applications. Many of David's past performances can be found at: http://cnmat.berkeley.edu/new_music/people/3093. The impressive list of his published papers is found at: http://cnmat.berkeley.edu/research.

We note, however, that the heft of his publications was rivaled whenever he held forth in his deep, measured, searching, *purring* voice. Here is a partial transcript of him talking extemporaneously in San Diego, at the University of California Music Department, as a part of its Composition Area's groundbreaking SEARCH initiative (which brought 18 composers of all stripes from around the world to speak about "The Future of Music"). David's talk, "A Perspective on Technology and Music", took place on the afternoon of February 17, 2001. He was sharing recent developments at CNMAT, and stressing . . .

> " . . . [a] kind of futuristic topic . . . I hope I can organize it all to fit in this time period . . . I really think there's a lot to be said for some recent developments in machine learning as applied to music.
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> So what I would like to do is just tell you what we're up to, a little bit, along the machine learning line, and what it is, by way of example, to do machine learning . . . and along the way I hope to show you that there's some kind of curious things about what's important about sound quality and some things I hadn't thought of before.
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> . . . We wanted to provide a good source of control. So – what do most musicians do when they're controlling an instrument? Well they control the

> pitch and the loudness, to start with. . . . So what we can do now is to apply this machine learning idea to, maybe, develop the instrument model.
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> . . . the machine learning approach that we took in this particular problem was to use a neural network, although there are other options that would also be very interesting . . . I'm going to avoid talking about the technical details here. . . .
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> To make things simple . . . here we want to use something that's psychological, not just amplitude, but a meaningful measure of loudness. So we have a loudness model that we apply to the analysis data . . .
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> You can think of this as something that learns about the interrelationships between all of these features by trial and error – in a way . . . there's a teacher involved that's telling it what the output should be and there's a measure about how [well] . . . the output fits the real data and there's a method to adjust the parameters of the model so that the fit to the real data is better and better . . . in fact you can think of this as a kind of elaborate curve-fitting problem with lots and lots of input curves, but once we're finished with this process, we can throw the original sound material away, we can throw the analysis data away, and what we've got left is this network that should generate the good quality that we're looking for at the output. . . . Now I want to say something here. I always have to make this apology. We're simulating real instruments here, but it doesn't take very much of a stretch in the imagination to see how we can use this to do timbral interpolations and to make new kinds of sound material. And I just want to say that we're not obsessed with making fake saxophones and fake flutes . . . our goal is to test whether these ideas are reasonable."

David was the kind of guy about whom nearly everyone remembers the first time they met him—because his boundless energy and interest in everything lit a flame inside you. He was an adventurer of the mind and a generator of mad whirlwinds of ideas that were always more than one could assimilate at any given time. He was a truly exceptional man, scientist, musician, and unique in his absolute generosity toward others (although he does get the prize for the world's messiest desk!). Many of us felt he would just die suddenly at work, continuously on the go, totally dedicated to exploration.

In fact, David felt unique in many ways. He had a singular ability to catalyze creative awareness and growth, whatever the circumstances. Of course, he was an omnivorous learner. The range of his knowledge, which embraced molecular cuisine and mental disability, encompassed everything that could influence our experience of sound. It was disconcerting. At IRCAM in the early 1980s, David seemed an almost magical, migratory bird, a stork of the intellect who delivered bundles of useful insight and perspective seemingly inevitably, and inexhaustibly. The geometry of IRCAM involves several levels of offices and studios. Different individual researchers and teams inhabit these spaces. David would follow a meandering path through the facility that resulted, for the occupants of each space, in seemingly random visits. One day he would appear. He wanted to know what you were up to, what difficulties you might be having, what discoveries were emergent. He was a gifted listener in that he grasped quickly what the center of the situation was—whether all was well or whether components needed to be realigned in some way so as to become more productive. He gave away insights, references, parallels, enabling connectivities, proposals for action in a prodigious way. Then—suddenly realizing that something else called—he would exclaim (it always seemed genuine), "I'll be right back!" then exit the space and continue his unknowable route through "the house."

And his return could easily occur weeks later, but he would pick the discussion up where it had been left as though it had only been a few minutes. Anyone who knew David could tell story after story of ways in which his zest for life, for ideas, for experience, and for the tenderly caramelized pleasures of companionship in food and drink was made manifest for them. David made not one but many impacts on the lives of so many, impacts for which all of us will be always and deeply grateful. As George Lewis has remarked, David changed not only lives, but the course of institutions. His accomplishments, as a person, as an actor in this pageant of life we inhabit, individually and collectively, are to be admired and remembered for themselves, but also because of the generosity of mind and spirit that they displayed. As Bill Hartmann has noted, David Wessel's special genius was in energizing others. After a conversation with David, you suddenly felt that what you were doing was more important than it had been before. Often that was because David knew something about your work or about related work in another field that you didn't know yourself. As often, you were energized by David's irrepressible enthusiasm for the mix of music, perceptual psychology, and technology that was his life. Our field of science and art has lost a uniquely catalytic agent.