Do We Still Need Computer Music?
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To the question "Do we still need computer music?" a cynic might reply, "Did we ever?" Our cynic might argue that computer music was created in the laboratory with few links to prior musical traditions, and over a period of 50 years has failed to attract an audience beyond other practitioners. Similar arguments have been leveled against much pan-European art music from the 20th century, but for that music the use of traditional instruments, ensembles and performance venues suggests at least an attempt to continue an established musical tradition. Lacking those connections, computer music might simply be a failed mutation, diverging from the past but not constructing a viable future.

In a contrary view computer music may be considered a victim of its own tremendous success. At its outset computer music was the province of a small group of researchers and composers laboring at a small number of institutions, and very rarely did any of this work make its way into the public ear. As computers found their way into increasing numbers of institutions, and ultimately into the hands of individual artists, the ideas, music and software of those initial researchers and composers gradually emerged from the laboratory and university, and have been increasingly embraced by independent musicians. Today the use of computers to create music is ubiquitous throughout the industrial world. Most music created today is in some sense "computer music," and therefore one can ask if the term is now obsolete and better abandoned in favor of simply, "music."

In order to assess these claims about computer music, it is necessary to attempt a definition. Most simply, we might define computer music as music produced using a computer. Although this definition has the merit of clarity, it is perhaps too permissive. Is a solo acoustic guitar recital recorded on a laptop, "computer music?" I suggest not. The recording might just as easily have been made on analogue recording equipment. The fact of the use of a computer in the production of some music does not require that we consider the result to be "computer music." So, let us define computer music as music created using a computer that could not have been made without the use of a computer. That eliminates the marginal case just mentioned; but is our definition now too restrictive? What about "virtual analogue" synthesis on computer? Doesn't that just replicate what can already be done on an analogue synthesizer? In fact it does not. An extreme degree of control and stability makes digital synthesis qualitatively different from analog synthesis. Frequency Modulation was available on analogue synthesizers in the 1960s, but it was only with digital oscillators, completely controllable in frequency, amplitude and envelope, that John Chowning could precisely and reliably synthesize complex spectra in the instrumental simulations that he published in the 1970s, leading eventually to the wildly popular DX7 synthesizer.

Our definition of computer music is an "instrumental" definition since it categorizes by the tool, and not how by it is used. In this view, the category of "computer music" is

somewhat analogous to the category of "piano music." A Beethoven piano sonata is piano music. So is a Chopin prelude, Henry Cowell's "Aeolian Harp," John Cage's prepared piano music, and Conlon Nancarrow's player piano studies. A possible criticism of our instrumental definition of computer music is that it is stylistically agnostic. A great deal of music that we don't normally consider computer music automatically falls into the category as we defined it, particularly many forms of contemporary pop music. We might well view this result with equanimity and even embrace it as a reflection on the contemporary interplay between popular music and classical music. However this tolerant view runs the risk of overlooking the process of evolution found in stylistic genres, as well as the exclusion or at least marginalization of characteristics lying outside the genre. For this reason a distinction between category and genre is critical.

Is computer music a genre as well as a category? If it is, I suggest that we could get a good first approximation to this genre by defining computer music as whatever gets programmed on the ICMC. In this view, there is a self-identified group of computer music composers who choose to present their work on conferences of computer music. This work focuses on certain areas of concern such as algorithmic music, new methods of synthesizing and processing sound, interactions between live performers and computers, and so forth. This definition of computer music as genre may be criticized as being too restrictive. It limits computer music to work by members of the academy, excluding the work of non-academic sound artists who may use the computer in different and possibly more radical ways. In the contemporary spirit of tolerance, the ICMC has recently presented off-ICMC concerts for music or performers who wouldn't fit on the regular programming. By quarantining this music off to a separate space, we are perhaps even more strictly enforcing the boundaries of what is to be considered computer music, and we are doing this at an institutional level.

The above definition of the computer music genre as the domain of academic composers is just a start. But it is rather close to the definition adopted by Bob Ostertag in his 1998 essay "Why Computer Music Sucks." So I'd like to take a quick look at Ostertag's critique. Ostertag claims that, "as computers' presence in music has mushroomed from nearly invisible to downright unavoidable, the range of music considered to be Computer Music has become increasingly fixed and rigid." Ostertag identifies two reasons for these problems: 1) Artistic Stasis, that is the ossification of computer music around algorithmic composition and extended timbral exploration, and 2) Social Self-Interest, namely that academic practitioners put up barriers to what may be considered computer music in order to confer the role of expert upon themselves and deny it to outsiders. Ostertag notes several important uses of computer music techniques in popular dance music, such as sampling, and states "Yet sampling is not Computer Music. Why? Precisely because sampling is everywhere. If sampling is the legitimate domain of any teenager working on the family Macintosh, no one can claim a monopoly on its knowledge. Thus it falls from the rarefied heights of Computer Music, its vast impact and consequences notwithstanding."

Regarding Ostertag's first point, I dispute the claim that computer music, even in the most restricted sense of academic computer music has stagnated. Certainly much work

continues on algorithmic music and timbral exploration both inside and outside the academy. At the same time academic work done from the early 1980s through the 1990s in live computer music laid much of the groundwork for the laptop performance explosion that emerged in the second half of the 1990s. New areas of computer music are being explored in spatial performance and composition, physical performance interfaces, and physical modeling, all of which are being directly absorbed into musical practice. So the field of computer music is not stagnant. And further, the border between academic computer music, and non-academic computer music is becoming increasingly blurred. There has been much recent interest among academic composers and musicologists in various strains of popular music, as well as in many other forms of music beyond the pan European classical tradition. Indeed modern classical music itself is increasingly fragmented, and thus more open to cross-fertilization from other genres. Both the Internet and its concomitant distribution of music software, particularly freeware has created many avenues of shared influence into various sectors of popular music practice, some of which have fed back into evolving computer music practice. Thus the ubiquity of some computer music practices such as sampling is more likely to be celebrated in academia than feared. Otherwise, responding to Ostertag's second point, why do so many academic computer music composers and software developers make their software freely available on the Internet where the masses can discover and use the techniques embodied in this software, thus weakening the guild?

I first noticed this phenomenon of non-academics entering the field in the early 1990s on the Csound USENET mailing list where queries started coming in from people with domain names other than .edu. It was also instructive to watch Csound take off as a language while cmusic, a comparable program, languished in obscurity, mainly, I think, as a result of different distribution methods. Csound was freely downloadable by FTP. cmusic was part of the CARL distribution, also "free" except for a nominal charge of $250 to pay for mailing the distribution on a magnetic tape that would be of no use to an independent user lacking access to bulky and expensive tape drives.

According to the instrumental definition of computer music, the influx of all of this non-academic activity throughout the 1990s is still "computer music." But much of it does not fall within the ICMC's aesthetic boundaries, and here I'd argue that these outside influences have encouraged academic computer music to evolve, at least for some of its practitioners, at the margins. This can be heard in increasing ICMC acceptance of beat-oriented music and music based on recognizable samples. But at the same time, an ICMC concert will never be confused with a rave party. The instrumental definition necessarily remains broader than the genre definition.

So do we still need "computer music" as a term describing either a genre or instrumental set of possibilities? Let's consider some alternative terms. First, "electroacoustic music." As a rubric it is broad enough to encompass most computer music, with the important exception of algorithmically generated instrumental scores. And most electroacoustic music is created on computers today. Further there is considerable overlap in the composer communities of SEAMUS and the ICMC, suggesting a level of interchangeability between electroacoustic music and computer music. But despite its

wide acceptance across several communities, I find the term "electroacoustic music" problematic. It is extremely broad in its scope, comprising any music created with electronic synthesis and/or processing of acoustic sound. Nonetheless a great deal of music that clearly fits this definition, such as rock and techno music, is rarely if ever considered to be electroacoustic music. And, I must add, the word "electroacoustic" is rather awkward, using quite a few syllables to convey relatively little meaning. Perhaps the very vagueness of the term has led to its widespread adoption within academia. But for that reason it does not work nearly as well as the term "computer music" for that subset of electroacoustic music that falls within the definitions of computer music that we've discussed so far.

Another more attractive term is "acousmatic music." The definition of acousmatic music is based on an aesthetic intent, unlike "electroacoustic music." And while most acousmatic music is now created on computer, its aesthetic focus means that a large amount of computer music is not acousmatic music; live laptop music for example. Indeed we might ask whether we wish to consider acousmatic music to be a subset of computer music at all, given that the acousmatic outlook sees the computer as a means to an end, with little interest in the technical possibilities of computer music for their own sake. In this view acousmatic music is done *on* the computer, but is not *of* it.

So perhaps there is still a need for the term "computer music." I find the term useful to explain my work to non-experts since most people know what a computer is, even if they don't know what an acousmatic or an electroacoustic is. And I think it's a good idea to develop terminology for talking with the general public as well as amongst ourselves. But how much is the term still used in practice? As a crude popularity test, I recently googled the three phrases we've discussed here. Electroacoustic music came in with a respectable 380,000 hits. The hyphenated version found another 186,000 hits, which reminds us of another problematic aspect of electroacoustic music - we can't even agree how to spell it. Acousmatic music found only 93,000 hits; rather less than I expected but this does make sense as acousmatic music is ultimately a sub-genre of electroacoustic music. Computer music came in with a healthy 4,600,000 hits. So clearly the phrase is still in use. Equally interesting, the first 10 hits included a mix of academic sites and sites for pop musicians and hobbyists, suggesting that the term "computer music" is well disseminated outside of academia.

Given that the term "computer music" retains some utility, is the practice, and more specifically, the practice of academic computer music still useful? I think it is safe to say that the ICMC itself remains isolated from any musical public outside of computer music practitioners themselves. But the laptop revolution and the transition of techno music to software-based technology has led other musicians to an awareness of the academic computer music practice, and repertory to a degree. One recent example is Radiohead sampling Paul Lansky's "Mild une Leise" on "Idioteque," a song on their platinum record Kid A, giving credit for the sample, I might add. And this influence has worked both ways, with increasing numbers of academic computer musicians incorporating beat-oriented, tonal or other vernacular elements into their computer music. Beyond established academic computer music work that finds its way to the street, academia has

one important luxury generally lacking in pop music: the brief to experiment without regard for the commercial value of the results. Computer music has a strong record of producing experimental work of unknown commercial value that subsequently proliferates wildly into the practice of commercial music, an achievement that has not always been the case for the pan-European avant garde, serialism being a notable example.

As the field of computer music expands, the term necessarily loses some of its specificity to subgenres: fixed media computer music, live computer music, interactive computer music, sonification, intelligent dance music, game music, live coding, and many others. However the term "computer music" still defines an area of shared concern among a large number of composers and researchers both in and out of academia. The more ubiquitous something becomes, the more invisible it becomes. So it is more likely for someone to think, I'm making music with Csound, or playing a set with Ableton Live, or doing a mixdown with ProTools, than to think "I'm making music on a computer." But that still describes what a great many of us are doing.