

Feeling Like an Agent

by Ritwik Banerji

"Much better. Seemed responsive."

These are the brief, written comments of an improviser — let's call him "Charlie" — after the third of ten takes during an experiment conducted at the Center for New Music and Audio Technologies in the fall of 2010. His remarks refer to his experience of playing with Maxine, a virtual performer of free improvisation I designed several years ago to listen and respond to improvisers as if it were just another human player [Banerji 2016]. As he makes clear, he finds, for whatever reason, that this particular take, in which he played a custom-built digital instrument with a highly sensitive tactile control interface and Maxine played a combination of percussion and live sampling, to be a superior experience to the two that preceded it.

So then what was the difference that led him to give a more positive appraisal of this piece? While Charlie's sense was that the system was audibly demonstrating that it was listening to his playing, nothing could be further from the truth. Like any other participant of this pilot study, Charlie was wholly unaware of the real conditions

under which he was playing with Maxine. Whereas in the first two takes, the system was in fact receiving live audio signal from Charlie, the system was set to listen to a dummy track during this third take. Nevertheless, Charlie finds that Maxine is demonstrably more sensitive in this third case.

Of the takes where Maxine was deliberately set to not listen to anything Charlie was playing, he found that the system was more responsive (and that this was a positive attribute of the experience) in only two of four. Likewise, he certainly found that the system was listening in a handful of the other six takes, when Maxine was, in fact, listening. All the same, Charlie's comments reflect a very curious state of affairs, in which an individual has been led to believe that his effect on his social environment far exceeds what any reasonable rational, scientific perspective would conclude.

More formally, Charlie's experience in this experiment exemplifies a rather unsettling phenomenon, increasingly observed across a broad range of studies of human agency [Wegner 2002, Bayne 2008, Desantis/Roussel/Waszak 2011], wherein one's first-person understanding of the degree and form of one's effect on the

situation is drastically different from the amount of agency which one actually has. In such situations, the nature of agency itself — as a scientific fact of how events or changes are caused — does not change; from a technical standpoint, perceptions or illusions of agency are wholly irrelevant. Rather, it is that a combination of elements in the situation brings the human subject to understand that they were the cause of events when nothing of this sort is true.

As strange or convoluted as such problems may seem — and indeed, no one should fail to register them as such — they are of relevance for a broad swath of artists using technology, and particularly computation, as a means of achieving their creative goals. More importantly, the differential between agency one believes they have and agency the same subject actually has further illustrates the tremendous importance of a rigorous approach to the evaluation of new systems and tools at the intersection of computation, sound, and music. While a designer can do a great deal to attempt to offer the human musical participant a feeling of agency, that feeling of agency cannot be directly produced. It cannot be guaranteed even if the system itself is

constructed such that the human collaborator's actions are continually analyzed and used to drive the system's behavior.

Charlie's encounter with Maxine allows for an analytical distinction between two layers of agency:

- 1) the factual, scientific lines of causality by which an entity causes changes of states of affairs in the real world and
- 2) evidence that such causality is in effect.

This distinction becomes quite helpful in analyzing how many other improvisers have made sense of what was happening in the course of their interactions with Maxine. Strictly speaking, the system always receives live audio signal from the human performer. This signal is constantly being analyzed and is in no way filtered before it passes through the system's feature extraction layer. From a purely technical standpoint, this means that the human participant always has a significant degree of agency with regard to how the system will behave.

All the same, many improvisers who have encountered this system have had experiences with it which are radically different from Charlie's. For the most part, performers have felt that they had little agency in the

system's performance. However, the meaning and desirability of this feeling of agency is by no means universal across all improvisers. For example, one Berlin-based American cellist, "Francis," found his experience of playing with Maxine to be positive, to the point that he felt it was preferable to some improvisatory encounters he had with human musicians. At the same time, he flatly declared that he felt that the system "didn't listen." On a purely technical level, what Francis says is not really true. Though there are inevitable differences between what the complex of the human auditory system does and the remarkably reduced version of this sensory, cognitive process which forms Maxine's perceptual layer, it remains that Maxine is "listening," whether Francis feels this is the case or not.

The "facts" aside, it obviously didn't make enough of a difference to Francis that the system was listening to what he was playing. If he had agency in the system's behavior, then there was insufficient evidence for him to come to an understanding that he had much of an effect on its choices at all. While Francis found it favorable that the system lacked an ability to demonstrate that he had agency in its behavior (or "listen," as he put it),

another improviser found the same trait undesirable. Like Francis, "Laurie," an American trumpeter also based in Berlin, found that there wasn't much evidence that the system actually listened to what she was playing, an element of the system's behavior she found so irritating that she stopped in the middle of a piece to tell me that this was what she felt.

In both of these cases, the human participant's understanding of the matter is "wrong," in the sense that the conclusions they make about the situation would not stand up to scientific reasoning. The system is always taking information from the human player; it is always listening. Be that as it may, it would be quite foolish of me to tell them that. Aside from the obviously confrontational nature of such a declaration, it ultimately matters quite little whether the system receives information from the environment. What's important is that the performer actually feels that they had an influence on what Maxine actually does since this is the primary sensory basis for any claim they may subsequently make that they felt a degree of agency.

Returning to Francis' understanding of his agency in playing with Maxine, as well as his preferences regarding

how such agency should be marked (or not) in improvisatory interaction, a further complication arises in the inherent ambiguity of this kind of “interactional” framework. Broadly speaking, there are two ways that an actor could lead another to believe that the first was not listening or that the second had no agency in the actions of the first:

1) the first actor could simply not listen, not taking any information or auditory input of any kind, or

2) the first actor listens intently, keenly analyzing the actions of the second, but never doing anything that un-equivocally indicates that information has been received from the first agent.

In the first case, the second actor has no agency; it is also quite likely that they experience no agency (unless we are talking about Charlie). But what do we say of the issue of agency — whether experiential or factual — in the second case? How does one distinguish between a deliberate choice not to respond (after having actually received information or registered sensation) and the nearly identical case in which a lack of a response is because no information or sensation has at all been received?

Under what conditions would a hu-

man participant still find that this kind of exchange offers some evidence or indication that one actor had agency in influencing or shifting the course of action of the other participant? In the end, it may be practically impossible to really tell the difference between an improviser (whether human or machine) that actively avoids displays of attentiveness and one that behaves as if it simply has a complete inability to hear what others are doing in its presence.

References

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