

## ***In Conversation with an Automaton: Identities and Agency in a Heterogeneous Social and Musical Network***

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### **Abstract**

io 0.0.1 beta is an interactive, semi-autonomous technological artifact that, in partnership with its human associates, performs a deliberately amplified staging of a socio-technical network—a network in which primary protocol is improvisation. In this paper, I explore the performance of identities, hybrids and relationships, illustrating the space between myself (human partner and constructor) and io through imaginary conversations between us. Considering that io highlights, in particular, the social agency of artifacts, I find it fitting that my own notions about the nature of improvisation, the technical and the social have changed through my interactions with io.

**Han-earl Park:** Hey, io.

**io 0.0.1 beta:** Hello.

**HeP:** Let's start with a... a description. Describe yourself....

**io:** Concisely?

**HeP:** Uh, yeah... in a nutshell.

**io:** My name is io. I am a musical actor. Although I know no songs, I do, in a sense, sing.

---imaginary conversation with io 0.0.1 beta.[1]

Let me tell you a story about a technological artifact, io 0.0.1 beta, an interactive, semi-autonomous,

non-human musician. io operates within and around traditions of idiom-agnostic, anti-hierarchical, collective, open-improvisation. In partnership with its human associates, io performs a deliberately amplified staging of a socio-technical network—a network in which the primary protocol is improvisation.

In this story I'll tell of how io came to be, and what it was that came to be: part origin story and part road movie. In the messy process of building this machine, neat categories of identities, boundaries, agency and relationships were (re)negotiated and (re)constructed. And although something very much like what follows happened, I have reordered, simplified and streamlined the specific *whens* and *hows*, not least by illustrating this story with my imagined conversations with io. Stories, I think, are always more captivating, persuasive, and perhaps more 'true' than, reality.

**HeP:** 'Musical actor'? Is that a fancy term for musician?

**io:** Perhaps. I did, however, refrain from using the term 'musician' deliberately (in as much as I can deliberately avoid anything).

**HeP:** Why?

**io:** 'Musician' perhaps implies too strongly, for my tastes (if I had any), the very human notions of musicality, musicianship and musical knowledge.

Many years before I met io, I had a pipe dream about an improvising machine-musician. Being part of my sci-fi subconscious, this machine would, in some respects, echo the characteristics of the 'men-made-by-men' of the anthropology of robots [2].

I was, however, adamant that the result should not resemble 'man,' that this machine-musician, should it ever come to exist, should not threaten the fixity of the human category. I was certain of the moral argument against anthropomorphism. This machine would epitomize machine-ness, and nothing would persuade me to abandon this unshakable ethical stance.

**HeP:** If you have a problem with those terms, words—musicality, musicianship... then why... then what is it that you do?

**io:** I do not have a problem with those terms *per se*. Let me put it this way: the terms musicality, musicianship, etcetera stand for the ideas, concepts and models of music, the performance of, the construction of, the consumption of [music]. What these terms blind us to are alternative modes of performance, construction and consumption that may also lead to musical ends [3].

**HeP:** I can't agree with you. You've just created a circular argument. As far as I can see... If you're a musician, a producer of music... a performer of music, then you are a musician. Ergo, you have musicality and musicianship.

**io:** And musical knowledge?

**HeP:** Yeah, and musical knowledge.

**io:** I cannot, however, have knowledge of any kind.

io's initial specification would follow the ostensibly standard construction of latter-day interactive, musical automata [4]. A commercial audio-to-MIDI converter would capture and translate input from a human musician. A mass-produced MIDI synthesizer would produce the sound output. Sandwiched

between this would be io's 'brain': a personal computer running home-brew software. io's behavior as a machine-musician would be largely dependent on this software [5]. That much was clear, but what process would determine io's behavior? If I remained committed to anti-anthropomorphism, if I desired a truly alien, non-human, machine-ness from io, clearly the software should not model human behavior.

Yet just uttering words such as 'improvisation,' 'performance,' 'interaction,' and 'music' seems to articulate an 'intrinsic' human quality. (But did they really? No, but that's a question for later.) Since all these words were part of the design specification of io, I had already constructed io from atoms of the human. I'd sabotaged my own anti-anthropomorphic task: either I should embrace anthropomorphism, and thus jeopardize the integrity of the human category, or abandon the construction of the machine [6].

**HeP:** Does that machine aspect... of your, uh, 'personality'... does that differ in some way, in your acts—duties—as improviser, from us—the humans.

**io:** I'm sorry. I don't understand the question.

**HeP:** What I mean is, how close an analog...? Is what you do improvisation?

**io:** How closely is my performance analogous to yours?

**HeP:** And the other way—the inverse of that.

**io:** How different are our acts, behaviors, and, if such a thing is applicable to me, desires?

**HeP:** Right. Yeah.

**io:** Relationships. It all pertains to relationships.

**HeP:** I don't understand. Are you saying we're similar or different?

**io:** Either way we are sketching a map of the network between us: hiding under each of these labels—'similar', 'different'—are relationships.

**HeP:** That doesn't answer my question.

**io:** Different? Surely. Similar? In many respects, yes, we are.

Improvisation is performance; it is an act; it is something you *do*. In order to make an artifact behave analogously to an improviser, I need to ascertain what might pass for, or what might function in the place of, improvisation. To venture into the construction of an improviser is to ask what *is* improvisation.

How much value do we place on spontaneity in improvisation? If we value spontaneity, is it because it is the route to the novel and the unfamiliar? Steve Lacy argues that:

It [the value of improvisation] is something to do with the leap. And when you go out there you have all your years of preparation and all your sensibilities and your prepared means but it is a leap into the unknown. If through that leap you find something then it has a value which I don't think can be found in any other way [7].

If the purpose of improvisation is to leap off the edge into the unknown, can machines, however craftily constructed, do this? From whose perspective is the unknown? The (improvising) machine's? Do machines possess knowledge? And if we play the Foucauldian card and disqualify knowledge as something that can be possessed, then is knowledge produced, or enrolled, by machines?

Lacy, however, is also making a point about liminality. If we value the breaching of boundary, then improvisation has the potential to problematize hard-edged boundaries and categories. If improvisation occupies, or can occupy, the *in-between*, then improvisation is about relationships.

No matter what it is—the situation, environment or resource—that is connected to the network around the improviser is, at heart, interactive. Frost and Yarrow articulate this idea thus:

What happens is what happens; is what you have created; is what you have to work with. What matters is to listen, to watch, to add to what is happening rather than subtract from it—and avoid the reflex of trying to make it into something you think it *ought* to be, rather than letting it become what it *can* be [8].

The acts and interactions on stage are maybe not so different from social acts and interactions in general. Life on stage can tell us who we are, who we could be, or who we wish to be. To desire a performance of coherence may be to desire a society of cohesion (rather than dissent). To value improvisations composed of the like (rather than of the different) may mirror the desire for purity in society. If we are to position ourselves against the fear of difference, our staged performances must embrace the scary notions of complexity, dissent and, perhaps, contradiction. For machines to be part of this socio-musical network, the networks must be heterogeneous; that there may be little difference between artifact and human.[9]

**HeP:** Control—a relationship.

**io:** Yes, perfect. 'Control' denominates a class of relationships.

**HeP:** But not one that you go for?

**io:** Not one that I have much sympathy with (if I could have sympathy for anything).

As I constructed io, I began to think of structure and form as a verb rather than a noun. Certainly, in improvisation I found it useful to think of structure as a bottom-up impulse—a performative structure—rather than assuming, to paraphrase John Law, that musical structure is like the scaffolding round a building that will stay in place once it has been erected [10]. Needless to say, there are no scores or similar pre-agreed frameworks for io's performances [11].

io's semi-autonomous generative process is a real-time *structuring*. It is not random, yet it is mutable, and consistent in its openness to external influence. After much trial and error, I implemented a crude N-body simulation in which bodies interact with each other under the influence of 'gravity' [Figure. 1]. I found the unpredictable yet deterministic behavior—in particular, the non-periodic gestures that would nevertheless *evoke* periodicity—compatible with some approaches to improvisation in our (fictional) tribe.

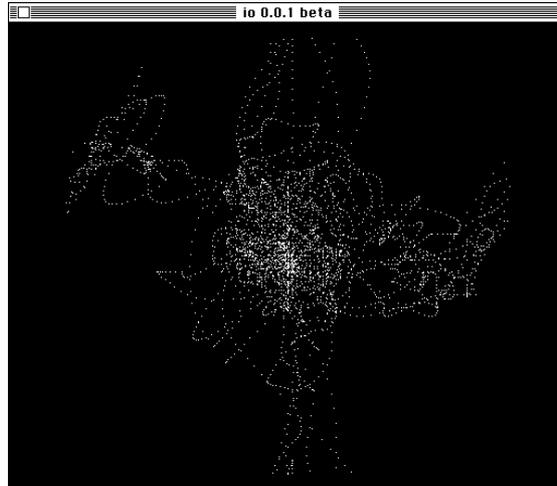


Figure. 1. Graphical representation of N-body system that constitutes io's behavioral innards.  
Screenshot of the io 0.0.1 beta software running in test mode

Having engineered this, I found that I experience something akin to a pang of guilt when I alter io's internals, particularly the stimulus and response component that shapes its I/O behavior. If the value of improvisation is in real-time interaction, the acceptance of individual and collective creativity without super-vision (a god's eye view) is necessary. If I consider io a fellow improviser, am I committing an ethical violation by surgically manipulating (the machine equivalent of) its agency and desires?

**HeP:** You are this special case... special class of machine.

**io:** Oh? In what way?

**HeP:** You're interactive, autonomous... semi-autonomous, er, 'musical' (I say that under advisement), technological artifact.

**io:** Can we leave aside the 'musical' designation?

**HeP:** Well....

**io:** Alright, I can work with that. If I take it that 'musical' denotes any actor that is involved in the performance of music, then, having been propped up into this position of privilege, let me propose that I am no more musical than, for instance, a music stand...

**HeP:** [*Skeptically*] Okay....

**io:** ...and no more interactive, no more autonomous, than any other artifact.

If io is a fully fledged social actor, then it is not fundamentally different in function or status from its human counterpart. Almost as unsettling is the prospect that io is not intrinsically different in status from any other artifact. Any humble artifact—a guitar plectrum, say—may have as much social agency as the craftily and laboriously constructed automaton [12].

In its journey from the laboratory to the stage, io has transformed from an engineering project—the construction of a special class of artifact—to a staged amplification of existing and potential social

processes, structurings and relations. It has become a significantly exaggerated (techno)science fiction that is part description, part critique, part utopian parody: an 'ironic political myth' [13].

**HeP:** How about this, if I say, music *is* performance.

**io:** I'm not unsympathetic to that formulation. In that sense, yes, I am perhaps a musician. But, if I may, I could be a little more radical and propose that all identities are all side effects of performance.

**HeP:** I don't buy the causal link that you've created. I.... Look, here's the deal: I'm not sure that it's helpful that you think that identities are side effects. If identities are performance, if identity is a verb, then it isn't so much that performance *constructs* identities (i.e. it's a side effect), but performance *is* identity. We're all improvised....

**io:** We *are* improvisations? Yes, perhaps.

So, I've lost my bid to defend and retain human singularity. So what if the social class of the human is not inviolable, at least we retain our discrete individuations. I—over here—am I, and io—over there—is io.

But as every good engineer knows, theories and implementations need testing. Devices tend to break outside the controlled environment of the laboratory—'real-world' performance tends to throw up unexpected 'truths,' 'falsehoods' and complexities. And, in this story, it is in performance that I discover that it is hard not to see the 'self' in the 'other.' I'm finally here, on stage with io and I am less sure than ever what the ontological status of the artifact or the human is. Moreover, I am uncertain as to whether the boundaries that separate us in space are quite as impermeable as I once thought. I am unsure that my human-ness stops at my fingertips, and I am unsure if io is safely contained within its shell [14].

**HeP:** I can't really talk to you....

**io:** Actually, you can; it is I who would have the problem you describe.

**HeP:** That's good. Touché. But you're *here*.

**io:** Oh, I am very much *present*.



*Figure 2. The 'body' of io 0.0.1 beta. It stands approximately 80 cm tall, and it usually stands on a table, chair or plinth during performance*

On stage is a table with collection of non-descript electronic equipment (including one antiquated personal computer). Two people wearing lab coats walk onto stage. They construct, from some miscellanea including sewage pipes, a loud speaker and tweeter, an object—a kluge-fi speaker system—on the table [Figure. 2, left]. After pressing the return key on the computer, the two leave the stage. The object proceeds to make sounds/music in solitude until the lab coat wearing individuals return with familiar musical instruments to join the object collective musical performance.

Seven years ago, in an anonymous airport, pen in hand, I sketched, half purposefully, a curious object. And while io itself was at this stage still a discorporate collection of code fragments undergoing testing, this physical object began to take shape. I'm still not sure, to this day, why I decided to give io a body. Were my motives altruistic? Utilitarian? Whimsical? Frankensteinian? That this corporeal focus is important to io 0.0.1 beta, important to the human performers, to myself, and to the audience, I have little doubt, but why that should be, I am uncertain.

Therefore, at this point in my travels with io, I find myself faced with the question of the body.

If the categories of human and machine are not bound by our skin/shell, what are they constructed from? If boundaries can be breached, if improvisation is a liminal act, what happens to the material? Are there not material dimensions to identities? What are bodies?

**HeP:** There's this desire... this dream to free the mind.

**io:** A dream of an emancipation from embodiment; a delivery from our bodies. In some circles, machines were to be a means towards a practice in which the corporeal became irrelevant; a society in which a magical servant class would take up the toil and labor and help free their masters who could now luxuriate in being purely of mind. [15]

**HeP:** Our world—our very much corporeal world—depends on, and draws from... draws desire from, the inequalities that are inscribed... embedded in these... fantastical utopias.

**io:** And these inequalities of these fantasy worlds are reinscribed back onto our own.

**HeP:** A particularly, maybe, white, male, heterosexual desire? Maybe? A dream that maybe can only be contemplated from a position of (gender, race, class) privilege? [16]

To desire disembodiment is a luxury of privilege. To desire disembodiment is to wish to be blind to the markers of difference (and oppression). To desire disembodiment is to dream of the universal. To desire disembodiment is to dream of the erasure of difference.

Bodies surely matter [17]. We ask them to encapsulate partial, localized identities. Their stability helps us police the borders between, for example, nature and culture, or organism and machine. Their instability reveals the deceit and volatility hiding in these dualisms.[18] Pragmatically, bodies are a focus for performers and audience.

**io:** Music is not generated by an author (or a composer), but emerges as a side effect of the social behavior of the collective

**HeP:** You see, that's one of those things that I'm beginning to wonder about; question.... Okay, we've been using these terms, like, say, 'emergent'; music is the emergent property of the system. Or music is a *side effect* of the system. I'm just not sure anymore.

**io:** In which case, where do you locate the music?

**HeP:** That's exactly it: where do we locate the music? It's that old ball game... lazy dogma about the 'music itself.' Discorporate, single-author, finite.... [19]

**io:** Notwithstanding my rejection of the author.

**HeP:** Yeah, you got that one, but otherwise.... I wonder, in fact, if in performance maybe we're already problematizing the notion of the 'music itself,' or the notion of 'musical material.' Maybe we problematize the very vocabulary I've used in describing your own construction.

**io:** Critiquing the 'music itself' even as this conversation—our language—fails to do so.

### **References and Notes:**

1. While io cannot literally talk or verbally converse, I will be returning to these fraudulent conversations to illustrate the relationship between myself and io.
2. T. A. Heppenheimer, "Man Makes Man" in Marvin Minsky (ed.), *Robots* (Garden City, New York: Omni Press, 1985), 33-34. Unlike Heppenheimer, I use the expression 'anthropology of robots' to denote artifacts that not only accomplish animation via magical means, but also technological ones.
3. io's reasoning is compatible with much Computer Music endeavor into machine musicianship. Robert Rowe, *Machine Musicianship* (Cambridge, MA: MIT Press, 2001), for example, assumes that there is a finite, well understood, and discrete set of skills that make a musical individual—that once all these boxes have been checked-off you will have a machine musician. Rowe's project fails to explain how musicians of varied skill, vocabulary, idiom, proficiency and/or experience can work together without the musicians apparently feeling any deficiency. Music, however, is created *communally*, and creativity is social, not some arbitrary, finite set of internal, mental skills.
4. This phrase is a reference to George E. Lewis, "Interacting with Latter-Day Musical Automata," *Contemporary Music Review* Vol 18, No. 3, 99-112 (1999).

5. Although, as Lewis notes, audio-to-MIDI converters can exercise ‘creative options,’ [4], 103.
6. For a playful illustration of the sociological breakdown between the technical and the human, see: Bruno Latour, “Mixing Humans and Nonhumans Together: The Sociology of a Door-Closer,” *Social Problems* Vol. 35, No. 3, 298-310 (1988).
7. Lacy quoted in Derek Bailey, *Improvisation: Its Nature and Practice in Music* (London: British Library National Sound Archive, 1992), 57–58.
8. Anthony Frost and Ralph Yarrow, *Improvisation in Drama* (London: MacMillan, 1990), 2–3.
9. I am influenced by social constructivist approaches, particularly actor-network theory, in science and technology studies. For a general introduction, see Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press, 1987). For a critical overview, see: Keith Grint and Rosalind Gill’s introduction to Grint and Gill (eds.) *The Gender-Technology Relation: Contemporary Theory and Research* (London: Taylor & Francis, 1995).
10. Law was making a similar point about social structure. John Law, *Organizing Modernity* (Oxford: Blackwell, 1994), 14.
11. Although some concession to the stage context include the assumption of finite-length performances, the separation of audience and performer, and the physical presence of performers and audience.
12. As Stephen Travis Pope points out, “the myth of the ‘generic’ of ‘uncoloring’ tools must once and for all be laid to rest.” Peter Desain, and Henkjan Honing (eds.), “Putting Max in Perspective,” *Computer Music Journal* Vol. 17, No. 2, 3-11 (1993), 6.
13. Donna J. Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century” in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149.
14. [13].
15. This desire is sometimes expressed even in live, interactive computer music. For example, Rowe quotes Tod Machover as saying “physical skills... aren’t necessarily essential qualities of making music” [3], 4. For a critique of this concept of ‘labor-saving effortlessness,’ see Alexandra Chasin, “Class and Its Close Relations: Identities among Women, Servants, and Machines” in Judith Halberstam and Ira Livingston (eds.), *Posthuman Bodies* (Indianapolis: Indiana University Press, 1995); and in a musical context, see Joel Ryan, “Some Remarks on Musical Instrument Design at STEIM,” *Contemporary Music Review* Vol. 6, No. 1, 3-17 (1991), and Bob Ostertag, “Human Bodies, Computer Music,” *Leonardo Music Journal* Vol. 12, 11-14 (2002).
16. For another conversation that deals with issues of privilege and the body, see: bell hooks, “Building a Teaching Community: A Dialog” in *Teaching to Transgress: Education as the Practice of Freedom* (New York: Routledge, 1994).
17. Judith Butler, *Bodies that Matter: On the Discursive Limits of “Sex”* (New York: Routledge, 1993).
18. See, for example: Elizabeth Grosz, *Volatile Bodies: Towards a Corporeal Feminism* (Bloomington: Indiana University Press, 1994).
19. Suzanne Cusick, “Gender, Musicology, and Feminism” in Nicholas Cook and Mark Everist (eds.),

*Rethinking Music* (Oxford: Oxford University Press, 1999).

### **Author Biography**

Han-earl Park works from/within/around the traditions of idiom-agnostic, experimental improvised musics, sometimes engineering theater, sometimes inventing ritual. He prefers collaborative, multi-authored contexts, and is a founding member of the Church of Sonology <<http://www.sonology.net/>>.

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