

2017 • Press

Golan Levin

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- 002 Taylor, Benjamin. "A History of the Audience as a Speaker Array". *NIME'17 (New Interfaces for Musical Expression)*, May 15-19, 2017.
- 008 Haridy, Rich. "Art in the age of ones and zeros: Internet art". *NewAtlas*, 3/23/2017.
- 012 Thapan, Prashast. "We Went to the Weird Reality Symposium To Find The Limits of Virtual Reality". *Vice*, 2/3/2017.
- 019 Schulze, Troy. "Day For Night Visual Artists – Golan Levin". *Houston Public Media*, 3/1/2017.
- 020 Smith, Greg J. "Design I/O's Mimic – Putting emotional machines within arm's reach". *CreativeApplications*, 3/7/2017.
- 024 Gu, Grace. "SAIC Professor Brings Back the Camera Lucida and Raises \$300K on Kickstarter". *Chicagoinno*, 5/30/2017.

A History of the Audience as a Speaker Array

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ABSTRACT

Distributed music as a performance practice has seen significant growth over the past decade. This paper surveys the development of the genre, documenting important precedents, peripheral influences, and core works. We additionally discuss common modes of implementation in the genre and contrast these approaches and their motivations.

Author Keywords

Audience Participation, Distributed Music, Mobile Music, Network Music, Web Audio, Jose Maceda

ACM Classification

See H.5.5 [Information Interfaces and Presentation] Sound and Music Computing—Methodologies and Techniques H.5.3 [Information Interfaces and Presentation] Group and Organization Interfaces—Collaborative Computing, C.2.4 [Computer Communication Networks] Distributed Systems.

1. INTRODUCTION

"Announcers at every modern-day concert command us to turn off our cell phones, but what Cagean aesthetic possibilities might we discover in leaving them on?"

So rings Golan Levin in the artist's statement for *Dialtones: A Telesymphony* (2001) [11], a foundational composition in the emerging genre of **distributed music**: music that performs an audience's electronic devices as a unified instrument or invites their participation as an impromptu electronic ensemble. This is a question that he and others have begun to answer through dozens of performances and compositions worldwide, in a variety of modes and models, but all originating from a common condition: the average concert hall now contains hundreds of latent speakers, residing in the pockets of virtually every audience member.

Yet this performance genre lacks a collected history; most existing overviews list only a few works, and do not give a comprehensive image of the emergence of the genre. While mobile, networked, and participatory computing have defined the last decade, the history of this genre precedes the smartphone, with roots stretching back over 40 years.

In this history, we look closely at two foundational works in the genre—Jose Maceda's *Ugnayan* (1974) and Golan Levin et al's *Dialtones: A Telesymphony* (2001)—and additionally document over a dozen performances which contributed to the genre between 1990 and 2016.

1.1 Ingredients for a Genre

The projection of music from within the audience occurred in many traditional formats, such as the church in which the whole audience sings. The current refocusing on audience involvement occurs at the confluence of several 20th century developments: electronic broadcast technologies provide new modes of distributing sound, while the development of multichannel speaker arrays has established paradigms for placing many individual electronic sound sources around an audience. A further contribution comes from the rise of participatory art as a genre in the 1950s and 1960s, when artists such as Allan Kaprow and Fluxus integrated the audience into their Happenings. By distributing performance instructions to the audience and considering them participatory agents, Fluxus and other artists established a framework through which an audience can help generate an artwork. As part of this movement, Laurie Anderson created an early example of a distributed sonic artwork when she performed *Car Horn Symphony* (1969), conducting an audience at a drive-in theater in New Hampshire to sound their car horns in a collaborative concert.

2. FOUNDATIONS: UGNAYAN

Filipino professor Jose Maceda's (1917-2004) acoustic and electronic works for masses of participants offer perhaps the most substantial framework for distributed music performance, a framework which has been replicated by many contemporary composers. Among his masterpieces, *Ugnayan* (1974), for a mass of participants with individual radio receivers, may be his most influential work. Broadcast on all 37 active radio frequencies in the city of Manila, the work encouraged residents of the city to take their radios out into the streets and turn them up, in order to create a collaborative sound collage across the city. Promoted as part of a government agenda to demonstrate the unity of the country, the work also holds a complicated relationship with the political environment of its era.

2.0.1 *The Landscape Maceda Inherits: Creative Radiophony in the 1950s-70s*

Repurposing handheld radio receivers as instruments was becoming common in the years preceding *Ugnayan*. John Cage's compositions *Imaginary Landscape No. 4* (1951), *Speech* (1955), and *Radio Music* (1956) were composed for ensembles of radios (up to 12), using the volume dial and tuning dial of the radio as instrumental controls. 15 years later, Karlheinz Stockhausen's rigorous approach to the ra-



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NIME'17, May 15-19, 2017, Aalborg University Copenhagen, Denmark.

3. DISTRIBUTED INTERVENTIONS: 1990-2010

Twenty years after *Ugnayan*, several artists began to explore the collective creative potential of electronic devices of various kinds, demonstrating a variety of different pathways into distributed music.

3.1 Heath Bunting, Cybercafe (1994)

UK-based artist Heath Bunting's *Cybercafe: Kings Cross Phone-In* was a guerilla performance that turned the pay phones in London's Kings Cross train station into a sound collage. Publicizing the phone numbers of several dozen Kings Cross payphones via his website, Bunting instructed anyone to, at 6 PM on August 4, 1994:

(1) call no./nos. and let the phone ring a short while and then hang up (2) call these nos. in some kind of pattern (3) call and have a chat with an expectant or unexpectant person (4) go to Kings X station watch public reaction/answer the phones and chat (5) do something different.[3]

Bunting seems to comment on the new age of networked media: that traditional paradigms of one-way communication (such as a payphone, which normally calls outward) were disintegrating. He takes a one-way communications medium and interacts with it, setting a precedent for current distributed music paradigms in which a performer sends messages to an audience's mobile phone and turns it into a remote instrument.

3.2 The Flaming Lips, Parking Lot Experiments and Boom Box Experiments (1996)

In 1996, the American rock band The Flaming Lips, based in Oklahoma City, performed a series of collaborative sound experiments with collections of car stereos and battery-operated tape players. In the first series, called *Parking Lot Experiments*, singer Wayne Coyne created 30 individual audio tapes and handed them out to audience members gathered at the parking garage of an Oklahoma City mall. Audience members played the tapes simultaneously on 30 car stereos. Later that year, the group coordinated events in which audience members brought battery-operated tape players to play distributed tapes—events known as *Boom Box Experiments*. At the first event, in San Francisco, 100 audience members participated by adjusting their volume knobs in response to Coyne's conducting. The audio content for both events involved highly independent tapes played simultaneously, similar to the model espoused by John Cage.

3.3 Chris Brown and Guillermo Galindo, Transmission (2002-9)

In the 2000s, Chris Brown and Guillermo Galindo designed their own distributed radio performances in the spirit of Jose Maceda, whose work Chris Brown has championed and helped document. In a series of *Transmission* performances including in Mexico City (Fig. 3), Newfoundland, and San Francisco, Brown and Galindo used homemade low-power FM transmitters to distribute music over four radio channels. Audience members were instructed to bring radios to the event, and were given the same performative role that Maceda gave to his audience—to freely explore specific radio frequencies. Like Maceda's *Ugnayan*, events took place outdoors, in public areas of the city. Sound was broadcast to and received by the audience, resulting in the composition emanating from the radios of the audience and mixing with the city's environment.



Figure 3: Chris Brown performing *Transmission: Naranja* in Mexico City, 2002

4. FOUNDATIONS: DIALTONES

The first years of the 21st century saw a surge in phone art amid the widespread adoption of mobile phones. The ringtone became an *objet sonore* in artworks such as *Telephony* (2000) by Thomson and Craighead—in which 42 mobile phones placed in a gallery in London were called by viewers and call each other—and Peter Hrubesch's *Handy-wolke* (2001) in which 1200 mobile phones in a glass dome ring in response to crowd motion and calls from viewers.

In this context, an ambitious concert was imagined by Golan Levin, Gregory Shakar, and Scott Gibbons: a concert in which all sound would be made by mobile phones, primarily the mobile phones of the audience. *Dialtones: A Telesymphony* (2001) created "a chorus of organized social sound" by placing custom ringtones on the audience's mobile phones, and calling them from the stage. [11] Rather than the political sentiment of *Ugnayan*, *Dialtones* was purely a technological spectacle, a proof of concept of the musical potentials of a new technology.

4.1 Motivations

The *Dialtones* performance arose from a variety of motivations expressed by the creators, including: the opportunity posed by the mobile phone's sudden ubiquity; the intention to illustrate wireless social space; and the intention to treat the ringtone as a found object in the tradition of media art.

4.1.1 Accessibility

In an interview about *Dialtones*, Levin describes how the ubiquity of the mobile phone enabled the work:

Everyone is already carrying enough musical equipment in their pocket to participate in an orchestral ensemble. All you have to do is show up with your instrument, and it's your phone. [11]

The composers saw the opportunity to coordinate our pocket musical devices into a new type of mass electronic orchestra. By placing custom ringtone melodies on the audience's phones, the composers were able to emphasize the synthesis capabilities and musical possibilities of these common devices.

4.1.2 Social Space

Dialtones illustrated the wireless networks that surround us daily. As the artist statement for *Dialtones* states:

By placing every participant at the center of a massive cluster of distributed speakers, *Dialtones* makes the ether of cellular space viscerally perceptible... Everyone has such an individual relationship with their handset, and to suddenly think that you're part of a larger network of people... is something that is the case, but is rarely perceived. [11]

Dialtones can be understood as a sonification of our society's wireless networks, and as a reaction against the isolation of personal devices.

4.1.3 *Dialtones As Media Art*

Finally, *Dialtones* is a fetishization of the ringtone. The ringtone, in its unique sound and style, is used as a found object.

The ringing of mobile phones—ordinarily, the noise of business, of untimely interruptions, of humans enslaved to technology—is transformed into a sound of deliberate expression. [11]

While a work like *Dialtones* appears to be a new and novel event, it can be equally evaluated as an application of Modernist concepts to the present, such as: Laszlo Moholy-Nagy's philosophy of repurposing communications media for creative production; the Futurist's use of materials and sounds of daily life; and the notion of instrument invention as a way of accessing new musical forms.

4.2 Composition

Dialtones is structured as a concerto, a logical format for a piece which addresses the situated opposition of an on-stage performer and an audience chorus. The composers write:

The goal of *Dialtones*' three-part structure is to introduce the contrasting aesthetic possibilities of virtuosic real-time cellphone performance ("mobile phone jockeying") on the one hand, with coordinated-ensemble handheld-music on the other. [11]

The first section exposes the "orchestra"—the audience—through a series of sparse, humorous rings among the audience, then grows to a sustained musical interplay across audience phones. The second section introduces Scott Gibbons as a soloing "phone jockey" on stage, manually activating the ringtones of a handful of mobile phones which are amplified. The third section joins soloist and audience, as the performance "builds to a remarkable crescendo in which nearly two hundred mobile phones peal simultaneously." [11]

Like *Ugnayan*, the composers describe working with "sound-textures" rather than precise rhythms and melodies, no doubt a result of the lack of precise timing when coordinating so many devices.[11]

4.3 Performance and Legacy

Performed at Ars Electronica in Graz, Austria in 2001, *Dialtones* saw nightly audiences of about 200 participants. The composers set up a kiosk in the lobby of the concert hall to download custom ringtones onto the phones of incoming audience members in order to control the musical content of the concert (about two thirds of those downloads were reportedly successful).[11] The composers exerted further control over the performance by giving each audience member a specific seat in the hall, therefore enabling precise management of the spatial distribution of sound in the audience during performance (Fig. 4). The venue featured a

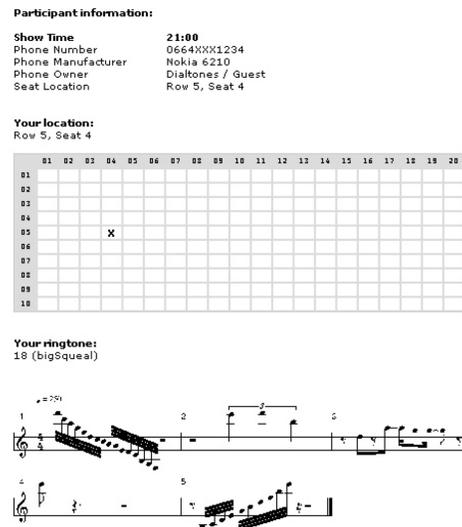


Figure 4: The *Dialtones* program, including seating location and custom ringtone score.

sophisticated visualization system wherein lights shone on audience members as they were being called, and a large mirror reflected a top-down view of the audience back to itself.

While *Dialtones* is the most commonly attributed precursor to modern distributed music, it contrasts starkly with *Ugnayan* in many respects. *Dialtones*' tight control over seating is rarely seen in contemporary distributed music, while Maceda's encouragement that the audience casually explore and participate in the work is a more common experience. The sound content of *Dialtones* is limited, due to the inflexible timbre of the ringtones of that era, whereas *Ugnayan* was able to broadcast richer musical content. A final distinction is that the *Dialtones* audience is passive, whereas *Ugnayan*'s is actively interacting with the radio as a musical interface.

However, *Dialtones* codifies many aspects of the genre: harnessing the ubiquitous mobile phone as a sound synthesizer, and using a network to coordinate a variety of sound events across a concert audience. Levin's core assertion that "[the mobile phone's] potential as an ingredient of art has been largely overlooked," [11] however tongue-in-cheek, has proved prophetic for a generation of mobile musicians and for the genre of distributed music.

5. EMERGENCE OF A GENRE: DISTRIBUTED MUSIC

Since the release of the iPhone in 2007, distributed music has transformed into a more flexible genre and coalesced around certain modes of implementation. The audio synthesis capabilities of the smartphone allow for richer, more diverse sound events, and the internet as a coordinator allows for more sophisticated communication schemes between performers and individual audience devices. Concerts have also become more feasible; most concertgoers already have the requisite materials in their pocket, rather than needing to show up with a special radio or stereo. Performances worldwide from 2010 to 2016 illustrate the proliferation of distributed music and its evolution from native mobile app instruments to networked web audio systems.



Figure 5: JODI’s *ZYX* mobile app, distributing body gestures to viewers in a gallery

5.1 Native Mobile Apps

From 2012-2014, projects by OK GO, Dan Deacon, Sang Won Lee, and Xavier Garcia distributed mobile music apps to their audiences to foster participation. Similar ideas were already being explored in mobile music, most notably by the Stanford Mobile Phone Orchestra whose 2010 concert focused on audience participation through distributed interfaces [12]. The strategy of interface distribution infiltrated visual art of the era as well, such as in Dutch art collective JODI’s *ZYX* app (2012) which instructs its users to perform body gestures, turning an art gallery into a surreal dance (Fig. 5). It is clear that ideas of mass participation were percolating in the years following the advent of the smartphone. Here, we focus on attempts to use this capability to generate sound from within the audience.

OK GO and NPR, *Needing/Getting* (2012)

Perhaps the first event to use an audience’s smartphones as a collective instrument, the Los Angeles-based rock band OK GO collaborated with National Public Radio to create an audience participation segment as part of a live film broadcast of the radio show “This American Life.” The app gave each audience member three buttons, each an impulse for one of three notes. The audience was grouped into four colors—each group with a different set of three notes—therefore achieving twelve different notes in all. The audience followed a scrolling score onscreen that directed them how to play with beginner-friendly symbols. Fascinatingly, the band chose to play along as a bell choir—another ensemble in which each player is responsible for only a handful of notes, which, played in hocket, are part of a larger melody created by the ensemble. Broadcast to 300 theaters across America on May 10, 2012, this led to 300 different distributed concerts occurring at the same time.

Dan Deacon, *America* (2012)

During the same year, Keith Lea at Wham City Lights developed a standalone mobile app to accompany Baltimore electronic musician Dan Deacon’s *America* album tour. Primarily a lightshow app, the app was advertised to also create a sonic accompaniment to the music performed. The app used an ultrasonic audio impulse to synchronize phones to within 0.06 seconds¹. The first concert occurred in Des Moines, Iowa, on July 7, 2012 and the band proceeded to perform with the app in over 50 other performances.

Sang Won Lee, *Echobo* (2012)

Sang Won Lee’s *Echobo* [10] [9] is a mobile instrument that is designed to be played by untrained audience members. In performances, audience members download the mobile

¹“Offline”CompanySitehttp://offli.ne

app which lets them play piano notes through a graphical interface. The cloud of audience notes creates a background texture while an electronic musician and acoustic musician perform on stage.

Xavier Garcia, *Belzebuth* (2014)

Xavier Garcia’s *Belzebuth* (2014), a 13-minute performance with the participation of the audience, was commissioned by Grame as part of their SmartFaust concert series featuring apps developed with the Faust language. In the *Belzebuth* app, the audience uses gesture, rather than a touch interface, to create sound, and are guided through a series of gestures by a conductor. The audience downloads the app beforehand through the web. Garcia notes how participation can change a viewer’s experience and help them understand the act of musical composition: “getting on the side of *doing*, [the audience] will experience a new audio sound as material, texture etc.” [6] therefore giving the audience insight into the compositional process.

5.2 Web Audio

Since the adoption of the Web Audio API [1] in mobile browsers in 2014-2015, and in tandem with open-source technologies developed within the Node.js framework, a number of distributed music performances have occurred which use websites as remotely-controlled audio synthesizers. Thomas Dolby, an early adopter of web-based audio in the 1990s, joked that while you cannot send a cake through a phone line, you can send the recipe if you’ve got flour, milk, and eggs on the other end. [4] It is in this model that the Web Audio API has transformed the genre, as performers can send small packets of control data to the audience in order to control sound synthesis on the client-side. Performances in this modality led to a series of entirely distributed concerts at the 2015 and 2016 Web Audio Conferences at IRCAM and Georgia Tech.

Tim Shaw and Sebastien Piquemal, *Fields* (2014)

One of the earliest distributed music performances to use web audio as a sound engine, *Fields* [16] premiered at the CTM (Club Transmediale) Festival on January 2014 in Berlin. In the work, all audience members with smartphones opened a mobile website which contained a web audio engine. One performer sent control messages via WebSockets to create music in the audience’s browsers, while another performer performed a Pure Data patch through speakers on stage (Fig. 6). These two soundscapes (stage and audience) wave together into a landscape of natural sounds, emanating from everywhere.

IRCAM, CoSiMa and Collective Soundchecks (2014)

In a series of events and demos called Collective Soundchecks, beginning in May 2014, IRCAM’s CoSiMa group explores many different modalities of collaborative performance using smartphones, inspired by the confluence of the smartphone’s ubiquity, multimodal sensors, real-time audio-visual processing, and web standards. [14] In the composition *Drops* by Norbert Schnell and Sébastien Robaszkiewicz, melodic fragments played by individual audience members are sent from phone to phone and resynthesized, creating an echo effect and motivic relationships across the audience. The group leads several initiatives to expand the capabilities of distributed music, such as achieving precise synchronization of musical events across phones. [8] Collaborative Soundchecks continue to be performed at events worldwide.

Ben Houge and Javier Sanchez *The Tomb of the Grammarian Lysias* (2014)

The Tomb of the Grammarian Lysias, for voice and audi-



Figure 6: Audience members hold sounding smartphones during Sebastien Piquemal and Tim Shaw’s *Fields*

ence mobile devices, deploys live audio recordings in real time to audience phones. As a vocalist sings the titular Greek poem, samples of the singer’s voice are recorded and transmitted asynchronously to the audience, where they play in a dispersed cloud on audience devices. Houge notes how the performance correlates to the ritual gathering described in the poem, as well as the poem’s description of wandering through a vast archive. [7] Houge also mentions that a core principle of his distributed music work is “to accept the sound of the phone and timing inaccuracies as an asset and build those attributes into the composition.”

Web Audio Conference (2015-2016)

The first Web Audio Conference, held at IRCAM in January, 2015, featured a concert consisting solely of distributed music performances using web audio technologies. The following works were performed: **Ben Houge**, *The Tomb of the Grammarian Lysias* (2014); **Sébastien Robaszkiewicz and Norbert Schnell**, *Drops* (2014); **Jesse Allison**, *Traversal* (2015); **Kita Toshihiro**, *Smartphone Jam Session with Audience* (2015); **Ben Taylor**, *Pearl River* (2015); and **Tim Shaw and Sébastien Piquemal**, *Fields* (2014).

The 2016 conference featured a distributed music concert of the following works: **Ben Houge**, *Ornithological Blog Poem* (2016); **Andrey Bundin**, *Concert for Smartphones* (2015); **William Walker and Brian Belet**, *Cross-Town Traffic 2.0* (2016); **Sang Won Lee and Antonio de Carvalho Jr.**, *Crowd in Cloud* (2016); **Nihar Madhavan and Jeff Snyder**, *Constellation* (2015).

6. CONCLUSIONS

Distributed music arose not from the smartphone, but from a common interest across many practices to harness everyday electronic devices as distributed sound agents. Composers distributed music by: broadcasting sound over radio, handing out cassette tapes, downloading ringtones, sharing musical mobile apps, and sending live control messages to web audio engines in mobile web browsers. In each of these instances, composers arrived at distributed music by exploring the affordances of everyday technology.

This history conveys not one modality of performance, but a diverse array of practices. Divergent choices among these works include: whether the audience should participate in musical decisions, or be a passive receiver; whether the timing inaccuracies of latency should be adopted as part of the medium, or eliminated; whether to discern the location of each audience member or not; and whether the audience’s devices should provide an accompaniment for stage sound or be the sole source of music. Regardless of individual perspectives among these choices, the worldwide

emergence of this genre indicates that, beyond its novelty, it offers a substantial new mode of musical expression.

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COMPUTERS

Art in the age of ones and zeros: Internet art

Rich Haridy | March 23, 2017



Cameron's World is a stunning piece of dense net art that curates scores of old Yahoo Geocities webpages into a giant clickable collage that's like tripping through old internet pages (Credit: Cameron Askin)

Art has always been fundamentally intertwined with technology. New techniques and materials have constantly allowed artists to innovate and create new types of works. Our series, which kicked off with examinations of "datamoshing", ASCII art, and BioArt, looks at the impact of digital technologies on art and illustrates how artists are creating entirely new forms of art using these modern tools. In this instalment we examine the weird, boundary-pushing world of internet art.



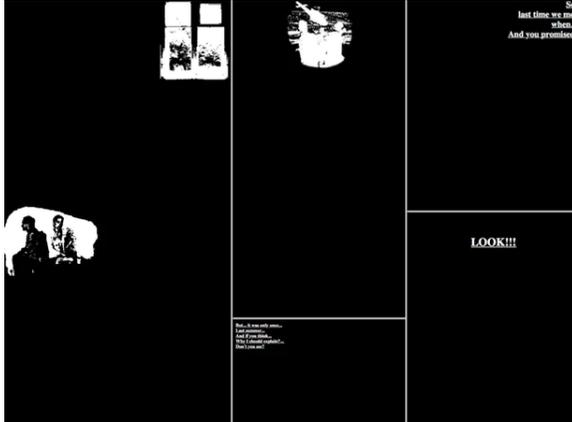
Internet art (commonly referred to by its practitioners as net art or net.art) is easily the strangest, most ephemeral field we've delved into so far in this series. It is ostensibly a form of art that can be defined as work that is primarily distributed through the internet, but that is oversimplifying things. Internet art is art that is inextricably linked to the internet, be it in the form of a strange website or a virus designed to spread through networks in a particular way.

Art critic Rachel Greene dates the inception of internet art as around 1993, with the advent of the graphical world wide web. And much of the 1990s can be seen as the golden age of internet art, a time where artists embraced this new frontier. One writer estimated that in 1995 as much as 8 percent of all web sites were produced by artists, giving the early web a gonzo-like identity that is still felt to this very day.



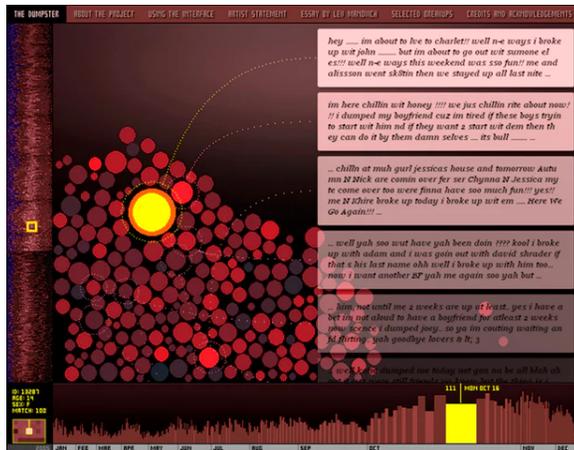
The front page of early net art piece wwwwwwwww.jodi.org (Credit: Jodi.org)

One of the most definitive early net art pieces was by a duo named [Jodi.org](http://wwwwwwwww.jodi.org). The work was called wwwwwwwww.jodi.org and still lives at that domain to this very day. Clicking through to the web page brings up a series of incomprehensible symbols. Inquisitive viewers may click into the page's source information and discover the real work - some clever ASCII drawings hidden in the code of the page. The artwork subversively reverses the general experience of navigating the internet, making the page code the artistic product while the site's front page is merely a random reflection of the work's true intent.



A screenshot from Olia Lialina's "netfilm" My Boyfriend Came Back From the War - the project can still be found online [here](#) (Credit: Olia Lialina)

Around the turn of the century as the internet became less the domain of mad creatives and more under the thumb of big business, the face of net art began to change. The Dada absurdism inherent in the internet had already started to normalize and many original net art pieces began to disappear.

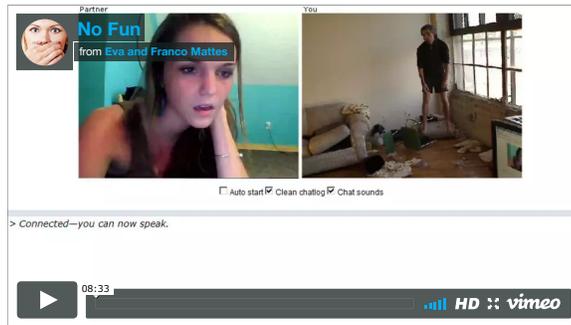


The Dumpster is an online visualization by artists Golan Levin, Kamal Nigam and Jonathan Feinberg - the project scrapes millions of online blogs for quotes from people posting confessionals about being dumped (Credit: [Golan Levin](#) with Kamal Nigam and Jonathan Feinberg)

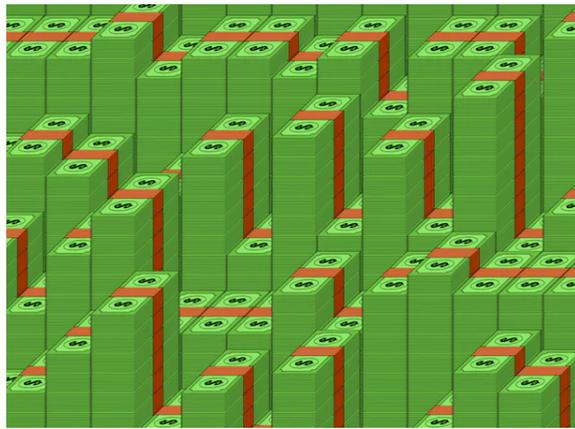
An organization called Rhizome arose in the late 1990s. Originally designed to be a platform for new media art, it quickly become the most prominent advocate for the preservation of net art. Ultimately, Rhizome became connected with the New Museum of Contemporary Art in New York and in 2016 acquired a US\$200,000 grant to start the Net Art Anthology, a two-year online exhibition dedicated to preserving and restaging 100 key artworks from the history of net art.

Over the last 25 years net art has taken many forms. Italian subversive net art duo Eva and Franco Mattes (aka <http://01001011010101.org>) have pushed the mold in often confronting directions. From a piece where they

created a computer virus designed to spread as widely around the world as possible, to No Fun, a frightening display where they simulated a suicide in front of a webcam and fed it into a Chatroulette-style cam service, filming the responses of their targets.



Rafael Rozendaal has made a practice of selling webpages in the same way one would sell a piece of art on canvas., challenging the notion that net art cannot be commercialized. He creates singular websites and sells them with attached domains. Even the Art Website Sales Contract is a strange bit of legal art in and of itself. Apparently Rozendaal has sold over two dozen of these websites for \$4,900 a piece, setting a fascinating precedent for commodifying digital art.



One of Rafael Rozendaal's websites for sale – this one is titled stagnation means decline .com (Credit: Rafael Rozendaal)

Jon Rafman is a Canadian net artist whose most prominent work is an ongoing project entitled 9-Eyes. Essentially the work is a Tumblr page where Rafman collects still images he finds on Google Street View. The work has a fascinating curatorial quality as Rafman captures an astounding variety of human moments, ranging from the beautiful to the horrifying. By recontextualizing these randomly captured images he manages to compose a body of work that is essentially machine generated.



Jon Rafman's 9-Eyes project collects images from Google Street View into an ongoing Tumblr project (Credit: Jon Rafman, 9-Eyes)

As with most accelerated cultural movements in the 21st century there are some who argue that net art has already receded into the annals of history, now replaced with post internet art.

The post internet art theorists argue that the internet has simply become another node for established artists and large corporate entities to build their brands. In many regards they are absolutely correct. Powerhouses like Google and Autodesk have set up creative departments that regularly churn out innovative, if vanilla-flavored, net art-styled work.



Cameron's World is a stunning piece of dense net art that curates scores of old Yahoo Geocities webpages into a giant clickable collage – it's like tripping through old internet pages (Credit: Cameron Askin)

There are still plenty of fascinating weirdo fringes working in the realm of net art, though. The old thrill of clicking through to something genuinely strange or confounding still lives on in the spirit of many artists working in the medium. Artists like Jonas Lund and Michael Manning for example, are creating gonzo net art websites for fans to stumble in and out of.

Check out our gallery for a bizarro trip through the strange world of internet art.





VIRTUAL REALITY

We Went to the Weird Reality Symposium To Find The Limits of Virtual Reality

PT Prashast Thapan
Feb 3 2017, 12:00pm

Can wearing a headset put you in someone else's shoes? Weird Reality was home to radical work that critically examined virtual reality as a tool to create empathy.

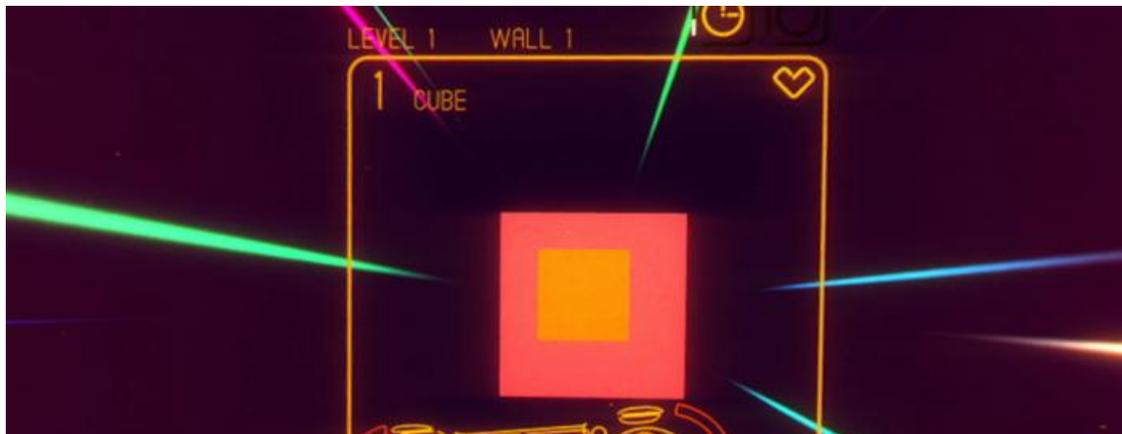
Header image courtesy of [Weird Reality Symposium](#).

Evangelists of virtual reality believe it [creates the ultimate empathy machine](#)—this idea was wildly contested at the [Weird Reality symposium](#) this past October. The weekend-long event showcased independent and emerging voices in virtual reality, departing from typical tech fantasies and normative corporate media.

It's far from [the world's largest VR expo](#) in terms of scale, but I was surrounded by a diverse group of critical thinkers who gave me a fresh perspective on how to use virtual reality to engage with the emotions of others. I learned that what makes virtual reality special is that it is never a passive experience. From where we direct our gaze to what challenging decisions we make, VR asks us to participate. The agency it gives us allows us to have a conversation with the experience—this is where the magic happens.

Weird Reality was an "unconference" and exhibition. The day involved bouncing around Carnegie Mellon University between workshops, talks, and panel discussions, while by night I found myself in a repurposed ballroom at Pittsburgh's Ace Hotel flanked by a row of people in headsets, while music bled into the room from the concurrent [VIA festival](#).

In this "VR Salon" some people queued up to play Kokoromi's [Superhypercube](#), while others sat on toilet seats to enjoy Laura Juo-Hsin Chen's communal bathroom experience [PoopVR](#). The VR Salon was a funhouse where each piece asked deeper questions about the emerging technology.



PIXEL BY PIXEL 12 MINUTES

SUPERHYPERCUBE: T...

For some, VR headsets don't necessarily mean "more immersion." While waiting in line for perogies, artist [Nitzan Bartov](#) mentioned to me that our literacy in video is more developed than VR, suggesting that watching videos can make us *feel* just as much (if not more) as being in a headset. Humans are hard-coded for empathy, so no matter how we are stimulated, feelings are inevitable, she tells me.

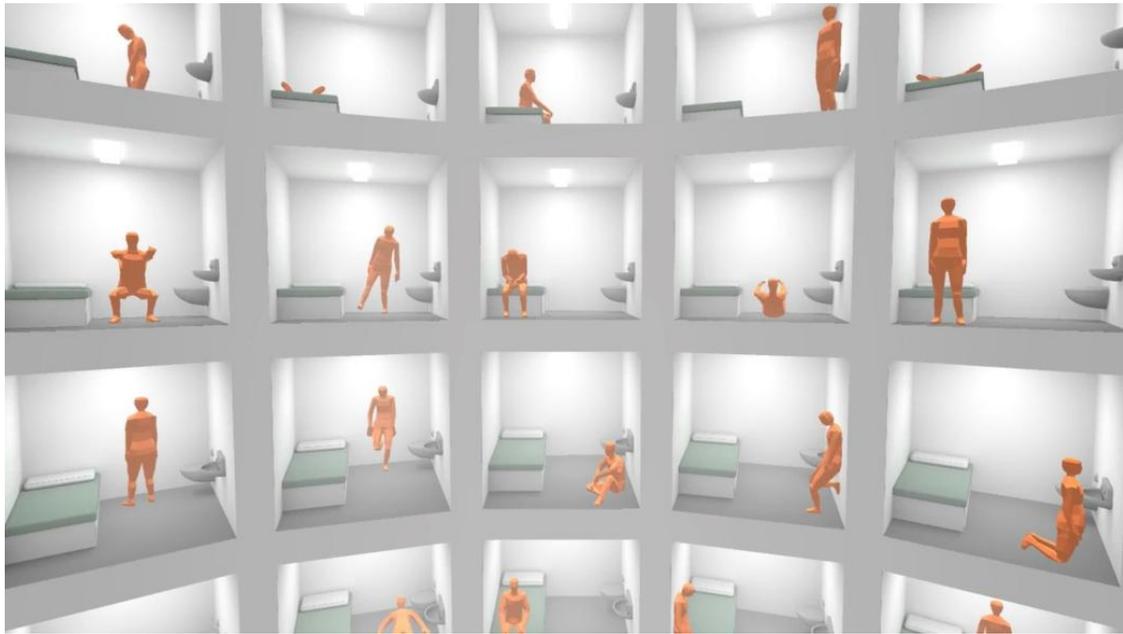
But when watching videos, I'm only seeing and not doing. Virtual reality frees me from the frame, allowing me to choose where to direct my gaze. In my experience, interactivity is an inherent part of virtual reality, and it can take different forms to elicit weird, new feelings.

An Interactive Gaze

"A sense of presence doesn't necessarily make you step outside the way you usually look at the world" said Ingrid Kopp, the curator of Tribeca Film Festival's virtual reality showcase *Storyscapes*.

360 documentaries distinguish themselves from video because they offer a sense of presence, Kopp suggested that pushing that sense of presence will determine the future of 360 video. She also expressed excitement about the possibility of combining storytelling and game mechanics through VR. "[There's] something about it being your point-of-view and you wanting to do something with that point-of view."

In [Molleindustria's *A Short History of the Gaze*](#) you literally use your point-of-view to navigate spaces. Imagine being in the middle of nowhere. You look around and spot a monument in the distance. Suddenly you're shooting towards it to document it with your smartphone. In another scenario, you're floating upwards through an infinite cylindrical jail structure where prisoners collapse if you look at them for too long.



Still from the trailer for *A Short History of the Gaze*. Image courtesy of [Molleindustria](#)

To better understand the function of interactivity in VR, I met up with Yasmin Elayat and Alexander Porter from [Scatter](#): a Brooklyn-based collective whose work interprets the social implications of emerging technologies.

Scatter teased its upcoming VR experience [Blackout](#) which transports you into the memories of strangers on the New York City Subway. "We want people to have the agency to choose how they navigate and how they want to experience it," Elayat told Waypoint. "It should be a dialogue, not a one-way storytelling machine." The work is an example of how interactions in virtual reality can affect behavior in the physical world. "We're not trying to dictate how people feel, it's more about setting up a scenario," said Porter. "Our hope is that people leaving the experience ask questions that they wouldn't otherwise, [and] listen closer than they would otherwise."



It was encouraging to see a VR panel not dominated by tech bros. Contexts and Conditions for Independent World-Making Panel at Weird Reality. (L to R) Angela Washko (Panel Chair; CMU School of Art), Jax Deluca (National Endowment for the Arts), Ingrid Kopp (Tribeca Film Festival), Winslow Porter (Independent Producer), Kelani Nichole (Transfer Gallery), Jason Eppink (Museum of the Moving Image), Lauren Goshinski (Co-Director, VIA Festival; co-curator, Weird Reality). Photograph by [Hugh "Smokey" Dyar](#).

The feeling of taking off a headset is like waking up from a dream and remembering everything. Memories created in virtual worlds can link with our personal realities. A virtual shopping experience called *Ditherer* by the Institute of New Feeling puts you in [a towering IKEA-style warehouse](#) where picking up an avocado transports you to the mythical origin of the fruit in your hand.

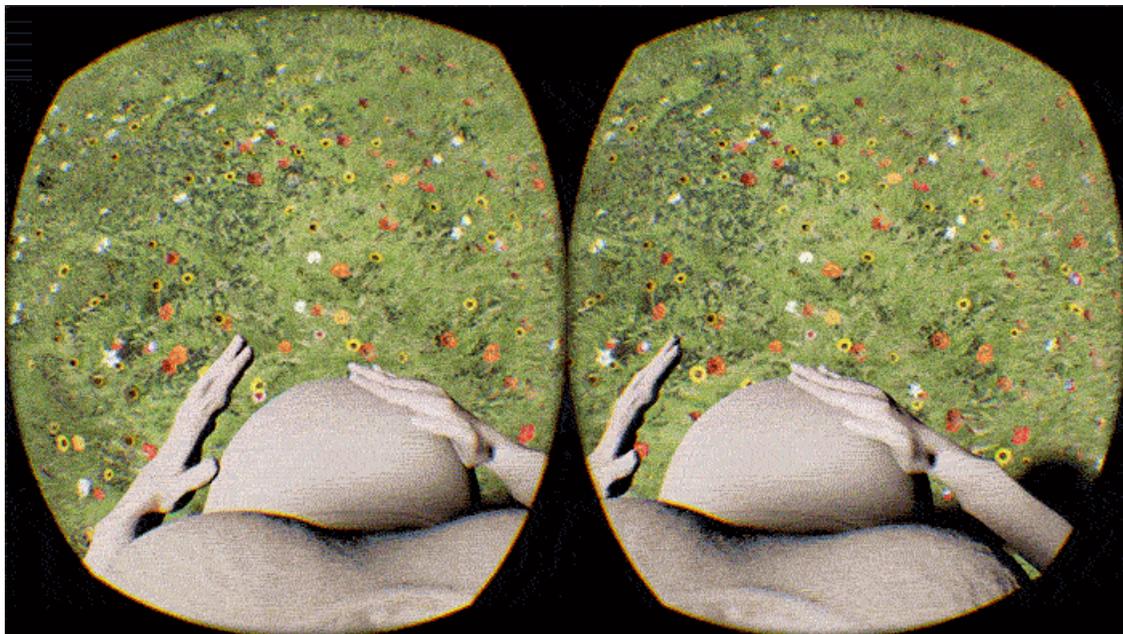
Your decision to engage with the avocado in virtual space creates a memory that changes your relationship with potentially all avocados. Now, everytime I pick up an avocado, I remember the warehouse collapsing before my eyes and a sunny Jeep trail unfolding in a Mesopotamian landscape.

The Impossibility of Presence

Conveniently located next to the bar, I discovered a [VR pregnancy simulator](#). It was a demo by the startup [Preterna](#), created by Kristen Schaffer and Jeremy Bailey. On trying it, I found myself in a lush field reminiscent of a Windows XP wallpaper. My hands were tracked with a Leapmotion attached to the headset. But as my virtual hands rubbed my new baby bump, my real hands felt nothing. In this disconnect, the satire of the work was evident.

"That's the whole thing about it—you *can't* be me pregnant," Schaffer told me later. While her body was 3D-scanned and manipulated to look pregnant, she wasn't actually pregnant—and neither are you. The work highlights the suspension of belief necessary to trick yourself into feeling present in virtual reality. New media theorist Wendy HK Chun summed up this sentiment succinctly in her keynote: "If you're in someone else's shoes, you've taken their shoes."

A creator's authorship over what someone feels is limited because everyone introspects in different ways. But allowing for decision-making in virtual reality lets creators use players' introspective mindspace to have a conversation with them.



Preterna emphasizes both the ability and inability of VR to transport a user from their own body. GIF courtesy of

[The Digital Museum of Digital Art](#) (or DiMoDa for short) takes the introspective museum visit into virtual reality. I took a break from the event to speak to the *DiMoDa* crew on Telegraph Hill. "It's the opposite of brick and mortar museums," said its creator Alfredo Salazar-Caro, "In simulations you can really make anything happen."

Its second iteration *DiMoDa 2.0* had portals to four experiences, one of which was [Miyo's War Room by Miyo Van Stenis](#). The *DOOM*-inspired game puts you in a world laden with pastel military tanks and shadowy monsters frozen in time. You find a weapon and approach a futuristic brothel filled with what DiMoDa's curator Helena Acosta described as "philosophical prostitutes"—the only sight of life. "You're pushing the viewer," Acosta said. "It's creating this odd situation where you're forced to have a reflective moment that brings your political reality into the game."

But to assume that virtual reality will bring a universal emotional revolution is a mistake. In November, when VR journalist Nonny de la Peña's acclaimed piece for the World Economic Forum titled *Project Syria* went up on SteamVR, it gained mostly negative reviews and angry (occasionally racist) comments accusing her of spreading propaganda. Although successful on large humanitarian platforms, the piece was attacked by gamers on SteamVR. Intended audience and actual audience will always be important factors.

Although it's impossible to simply create empathy from thin air by strapping a headset on your face, virtual reality can offer us a safe, introspective space away from the physical world. *Weird Reality* showed me work that created a dialogue through VR's inherent interactivity, where the creator and player can meet to build something new. Rather than providing me with answers, it let me ask questions. And instead of letting me escape into fantasy, it put me in situations where I confronted my own reality.



[IMMERSION](#)[PRESENCE](#)[EMPATHY GAMES](#)[WEIRD REALITY](#)

ARTS INSIGHT

Video: Day For Night 2016 Visual Artists – Golan Levin

Houston Public Media visited the 2016 Day for Night festival to meet some of the visual artists presenting dazzling art installations.

TROY SCHULZE | MARCH 1, 2017, 3:29 PM



Golan Levin is an interactive media artist who has described his work as a “poetic surveillance system.” He uses camera systems to capture body movements, which are then projected onto a wall with laser beams. Interestingly, the simple projections somehow retain some of the humanity of the subjects. The result is a sort of comic ‘cave painting for the 21st century,’ but it also evokes questions about technology and privacy.

Keep an eye out for *Day for Night* artist profile stories each day this week, and see the entire series on [Arts InSight](#) Friday, March 3, 8:30pm, on Houston Public Media – TV 8.



Published: 07/03/2017 | Views: 2,994 | c 1

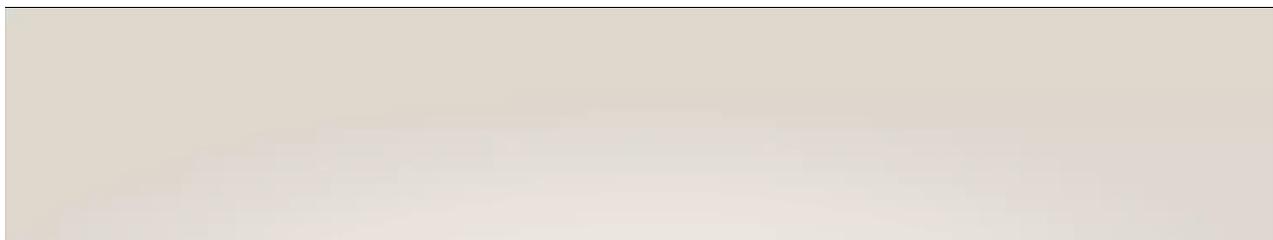
Design I/O's Mimic – Putting emotional machines within arm's reach

written by Greg J. Smith



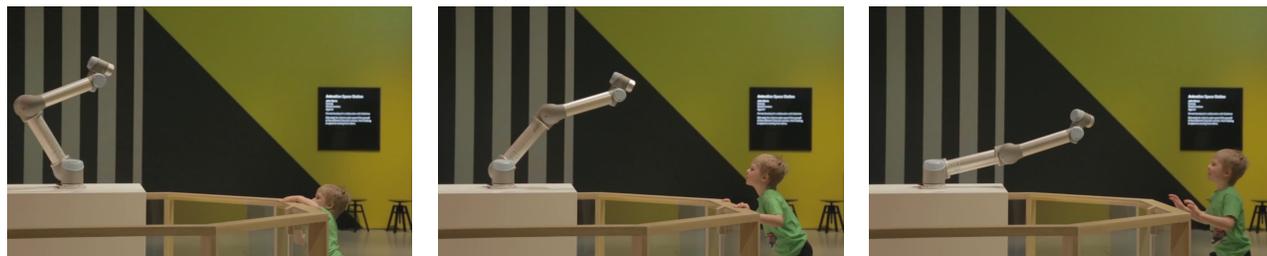
Robots have been a staple on assembly lines for decades and we've recently welcomed them into our homes to help out with menial tasks, but what happens when we bring machines designed for light manufacturing into social spaces? *Mimic*, the most recent project by the interactive installation studio Design I/O convincingly sketches how we might socialize with robots – and how they can be imbued with personality so they can return the favour. One of the centerpieces of this year's edition of TIFF Kids International Film Festival's digiPlaySpace interactive playground, the studio plunked a Universal Robots UR5 robot arm on a plinth in the middle of an exhibition hall full of fired-up kids. Using sophisticated computer vision rig (comprised of three overhead Kinects and one Kinect V2 sitting in front of the installation) and working around the arm's limited built-in functionality, Design I/O have created a playful and inquisitive being with a range of dynamic moods and actions that are triggered in response to whatever motions or gestures it detects.

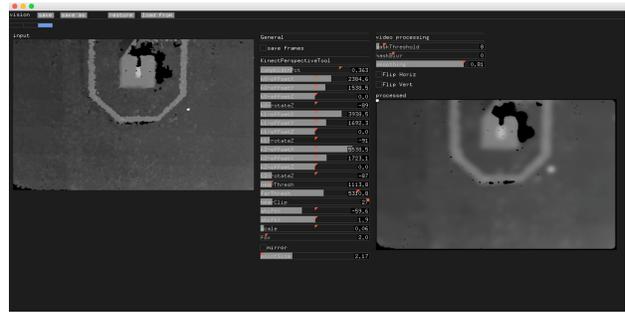
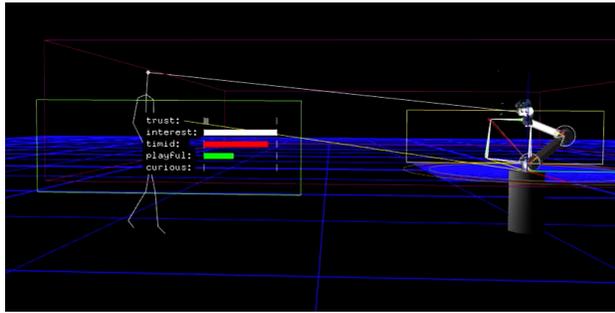
"You can get a bit of a wallop from it. You could definitely bruise yourself if you're in the wrong place," says Theo Watson of the responsibility implicit in taking control of the UR5. Beyond the necessity of putting a bit of space between the arm and curious children, a range of safeguards were needed to protect the arm from itself. "At the very end of development I found a way to get it working with a new interface which basically allows you to say 'I want you to be in this position and just get there.'" This *sounds* simple, but the UR5 is finicky about how it takes instructions; Watson says you have to treat it "kindly" – or else. "If you say 'move there within a sixtieth of a frame' it will just shut down." Likewise it is fully capable of whacking itself due to its expansive range of motion. Despite these difficulties the UR5 was definitely the right robot for the job. "It's exactly the form factor we wanted, something roughly the scale of a human arm." The model's reach is just under a metre, which makes it human-scale, especially compared to the daunting size of larger models.





While making the UR5 nimble was laborious, Design I/O were thrilled to breathe life into the arm and craft its personality. Like the whimsical animals of *Connected Worlds* (each with distinct physiology, a preferred biome, and innate tendencies) the robot arm needed a prerogative and disposition to drive how it responded to stimulus. "The feelings change based on how you act. One example would be timidity, if you walk aggressively towards it, it will feel threatened and retract a little bit." Design I/O's Nick Hardeman explains of the 'emotional inventory' they built for the robot. "There's also trust – she's been there for a while" he says pointing at a young girl planted in front of the arm, staring at it intently. "It might reach out to her because it feels comfortable with her." These emotions (along with interest, playfulness, curiosity) are calculated by who is in front of the arm, how long they have been there, and what they are doing. A slow and gentle presence may lead to the UR5 coming out of its shell, while more spastic gestures might send it reeling – or be reciprocated with its own exaggerated motions.





Underneath all that sophisticated character design there is a lot of computer vision heavy lifting going on. The three (chained) Kinects that surveil the installation from above evaluate proximity to the arm, and the V2 that is front and centre observes individuals in the sweet spot; it analyzes gesture, speed, heading, etc. of each person and uses that data to inform how the arm responds. It also needs to be able to decipher the inevitable crowds that form so the UR5 can figure out where to direct its gaze (hint: like most humans, new and/or dramatic movement will capture its attention). Then of course there are the safety protocols that need to be in place for if anyone breaches the perimeter fence.

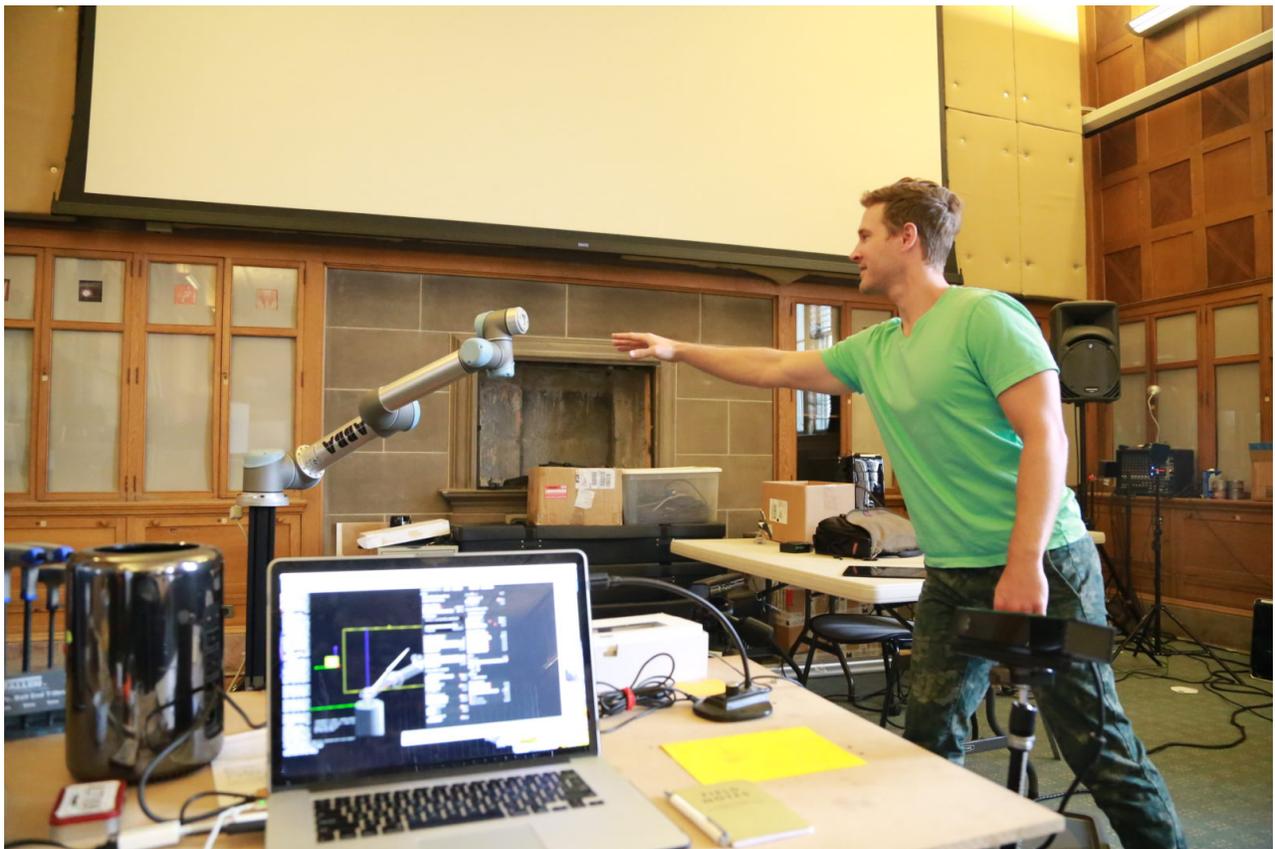
Unsurprisingly *Mimic* required the mobilization of several networks. The project grew out an idea that had been back burned during previous collaborations between Design I/O and (former) *digiPlaySpace* curator [Nick Pagee](#). It also received support from the [Frank-Ratchye STUDIO for Creative Inquiry](#) at Carnegie Mellon, which hosted Watson and Hardeman for a related residency. Watson notes that many of the problems Design I/O encountered echo those lab director Golan Levin faced in his (classic) *Double Taker (snout)* project in 2008, the likes of which are now being researched in his lab by Madeline Gannon and Dan Moore (*Mimic* draws on their *ofRobotArm* and *ofxURDriver* openFrameWorks libraries).

At a lecture hosted by Ryerson University's New Media Program three weeks ago Watson shed some light on where this new foray into robotics sits in relation to his studio's other works. While there is an impulse to describe it as a move away from augmented environments into physical media, *Mimic* is very much a return to their roots: the age-old desire to make inanimate form expressive drove their breakthrough project *Puppet Parade* (presented at Cinekid in 2011). "That's the strange thing," Watson says of his initial queries to the UR5 manufacturers, looking for resources to aid in Design I/O's ambitions to make the arm truly responsive versus automate it to run scripted routines. "When we asked for help about the real-time stuff they just said 'oh, we never do that' – and these are its makers!"

Project Page | Design I/O

Mimic is installed at TIFF's [digiPlaySpace](#) through April 23rd







(Photo credit: Pablo Garcia)



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SAIC Professor Brings Back the Camera Lucida and Raises \$300K on Kickstarter



Grace Gu

5/30/17 @11:55am in Tech



An Illinois professor has launched an innovative new art tool that's a modern reinterpretation of a device first invented in the early 1800s.

Pablo Garcia, an associate professor at the School of the Art Institute of Chicago (SAIC), turned his small art history project into a sought-after commercial product. In 2013, collaborating with Golan Levin, associate professor of Computation Arts at Carnegie Mellon University, Garcia raised \$425,000 on Kickstarter from 11,000 backers for his original [NeoLucida](#), a reinterpretation of the [camera lucida](#), an optical device used by 19th-century artists as drawing aids.

Now, responding to popular demand, he wants to bring [NeoLucida XL](#), a redesign of NeoLucida with bigger a viewing area and better lighting control, to people passionate about drawing. With just a few days to go, the second campaign has raised \$301,724 on Kickstarter, almost 20 times the pledged funding goal.