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Voting Booths and Interactive Art Installations: The Diebold Accuvote TS in Context

MIKE RICHISON¹

Introduction

Christiane Paul discussed the marriage of digital art and activism in *Digital Art*, a text first published in 2003. She related how projects in this vein often “use digital technologies as ‘tactical media’ for interventions that reflect on the very impact of the new technologies on our culture.”² She went on to state that a common approach involved turning “the technology back on itself.”³ I have always found this approach compelling in that often the digital technologies that begin the discussion are technologies utilized by large entities such as corporations or government bodies to control or surveil. Or, from a more positive viewpoint, I sometimes find myself among those that place faith in certain technologies and practices. Regardless of which side one finds him or herself, one should recognize the possibility of a complete failure of that system. It is this space and this medium—the space where faith in designed objects is lost, and where failure is as tangible of an artistic material as paint or stone—where I would like to operate as an artist.

There are four objectives or areas in this paper. First, I will speak about two projects from my own studio practice. One is finished, and the other is just beginning. Second, I would like to describe the work of other artists that are successful case studies of communication, concept, and audience involvement. Third, I will delve into the history and controversies surrounding the Accuvote TS voting booth manufactured by now-defunct Diebold Election Systems (Figure 1 in Appendix A). Last, I would like to address the failures of this voting booth and couple that discussion with music, video, and interactivity in my next studio project.

An underlying relationship between these objectives is the idea of connectivity and networks, topics that are very appropriate for *Journal of Network Music and Arts*. The connectivity that exists in these sections are at times electronic in nature—utilizing wires and signals, and at other times, social and ephemeral. In my own project, I will set up a small local network between several computers in multiple stations via an ethernet cables. The Max MSP Jitter environment will ensure

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² Christiane Paul, *Digital Art*, 2nd ed. (London: Thames and Hudson, 2008), 205.

³ Ibid.

that the stations share a tempo. Max's manufacturer, Cycling 74, describes it best: "Max is a visual programming language for the specialized needs of artists, educators, and researchers working with audio, visual media, and physical computing."⁴ Within Max, the tempo of musical projects is controlled by a built-in metronome, and there are also objects that send and receive network signals, including signals from the metronome itself.

The voting booth as a reactionary artistic medium is not new. In 2004, the Parsons School of Design hosted "The Voting Booth Project," an art exhibit of forty-seven modified Votomatic voting booths, the same system employed by Florida during the election debacle of 2000. Among the artworks in the "Voting Booth Project" are works by installation artist Christo, Talking Heads front man David Byrne and his collaborator Danielle Spencer, architects Frank and Sam Gehry, graphic designer Chip Kidd, along with other well-known artists and designers. Byrne and Spencer's installation featured two replicas of the silver Votomatic booth—an enormous one that voters cannot reach and another one that is too small and equally useless. About 40 rear-view mirrors adorned another voting booth like branches on a tree. This piece, *Hindsight 20/20* by architect Robert A.M. Stern, clearly makes a comment about regret and a desire to shift the democratic process in reverse to turn back time. "The Voting Booth Project" dealt with the failure of the Votomatic head-on. The Votomatic system did not register the votes of 180,000 voters due to what seemed to be a mechanical failure.⁵ This failure was one of several failures of the device. The result was cynicism, distrust, and a mountain of hanging chads.⁶ In 2016, I created my own take on the Votomatic voting booth, *Video Voto Matic* (Figures 2 and 3).⁷ The installation explored video, music, interactivity, and audience participation.

Previous Studio Endeavors

To create *Video Voto Matic*, I embedded iMacs running an original Max MSP Jitter patch into two vintage voting booths. The patch allowed users to remix presidential debate footage in a

⁴ "Cycling '74: Tools for Sound, Graphics, and Interactivity," *Cycling '74*, accessed October 22, 2019, <https://cycling74.com>

⁵ Gwenda Blair, "Designers Redefine The Political Machine," *New York Times*, October 7, 2004, accessed October 13, 2019, <https://search-proquest-com.ezproxy.monmouth.edu/docview/432894827/fulltext/B8C6E29A030D4C27PQ/1?accountid=12532>; "On the Drawing Board," *WWD: Women's Wear Daily*, September 24, 2004, accessed October 13, 2019, 14; Peter Plagens, "ART Tools of Democracy," *Newsweek*, October 18, 2004, 12; Mary Louise Schumacher, "Electoral collage: Artists put fresh spin on Florida 2000; 50 voting booths from disputed election are the canvas," *Milwaukee Journal Sentinel*, October 13, 2004, accessed October 13, 2019, <https://search-proquest-com.ezproxy.monmouth.edu/docview/263449782?pq-origsite=summon>.

⁶ According to www.verifiedvoting.org, "The Votomatic ballot is pre-scored at each voting position so that punching with a stylus through that position into an appropriate backing will remove a rectangle of chad, leaving a hole that is counted as a vote;" "Verified Voting," *Verified Voting*, accessed October 21, 2019, <https://www.verifiedvoting.org/resources/voting-equipment/ess/votamatic/>.

⁷ To see a video of the project, visit "Video Voto Matic (updated documentation)," YouTube video, 2:00, posted by "M Richioso," October 9, 2016, accessed September 27, 2019, <https://www.youtube.com/watch?v=reiEx4DFDhA>.

structured loop that played on an external monitor and a set of speakers. The physical interface included a custom-made “butterfly” ballot and mimicked the notorious Votomatic voting machines. The booth, ballot, and patch worked together as a mashup between the Votomatic voting system and a Roland TR-808 drum machine.

The iMac screen inside the voting booth itself showed a musical graphic interface that counted off a percussive 16-beat loop. To experience the installation, users inserted a paper ballot into the *Video Voto Matic* polling device. Like the real Votomatic voting booth, participants used a metal stylus to punch holes through a voting booklet into their ballot. Instead of providing the names of candidates, the booklet was filled with sample drum patterns, and rather than encouraging a single vote for a single presidential hopeful, the booklet helped users create a beat from short video clips stored on the computer. The resulting track was continuously fed to a set of speakers and a video monitor, completing the participant’s transformation from disenchanting voter to amateur electronic music producer. When they were finished, participants removed their ballot (complete with hanging chads) and took it home as a keepsake.

Video Voto Matic was conceived specifically for the 2016 election cycle. The piece was installed in the New York area during *Art in Odd Places*, *Internet Yami Ichi*, and a few other venues and events that welcomed this kind of public interactive art. The project was non-partisan, and it hopefully encouraged voters from all sides of the political spectrum to take a step back and have a little fun. The approach and mood of *Video Voto Matic* was very light-hearted, which seemed appropriate at the time.

The current adversarial political climate, rising intolerance and extremism, evidence of interference in the voting process, and well-documented failures of electoral systems have all raised the stakes for the next election. To coincide with the 2020 election season, I am currently working on an update and expansion of *Video Voto Matic*, a new project with the working title *Electo Electro 2020* (Figures 4, 5, and 6). The new stations will include a touch screen voting interface and multiple networked stations that will also utilize video clips of candidates to produce music. The interface and the computers that run it will be housed in the same voting booths that once housed the Diebold Accuvote TS, a paperless system susceptible to hacking. The Accuvote first appeared in 2002, and it was used as recently as the governor’s race in Georgia in November 2018. As a voting system, it is very difficult to audit.⁸

Video Voto Matic addressed the loopholes and failures in how we vote, but for the future iteration of the project, these topics must become more explicit. The Diebold Accuvote systems seem to embody a potential collapse in the democratic practice of choosing leadership at all levels of

⁸ Colorado Springs Gazette, “Georgia voters, Colorado nonprofit sue to overturn special election results in Georgia’s 6th Congressional District,” *The Washington Examiner*, July 4, 2017, accessed January 9, 2019, <https://search-proquest-com.ezproxy.monmouth.edu/docview/1916901755/fulltext/DBE27EFF58B041D7PQ/1?accountid=12532>.

government. There is an opportunity to use this installation as a means to build awareness of how the voting booth has served as a centerpiece of the debate surrounding voting rights.

Preceding Interactive Projects

Before I examine the Diebold system and its role, I will first relate preceding and like-minded projects. The projects mentioned here utilize a variety of approaches and media. As stated earlier, the *Journal of Network Music and Arts* has networks at the core of its conceptual agenda, these works all have some sort of connectivity. At times, this connectivity is an explicit digital network linking a computer to other computers, digital devices such as projectors, monitors, or media players, or it could join physical actuators such as motors to a circuit. At other times, the networking happens in a more conceptual or social sense. Moreover, when finding specific projects to discuss, I naturally looked for qualities that were present in my own studio endeavors, specifically the following features: multiple stations with some of scalability or modularity, a custom user interface, a deep amount of participant involvement, and, as mentioned before, connectivity.

The first few projects use a very familiar user interface, the piano keyboard. It goes without saying that the piano is familiar and inviting, guaranteeing audience engagement. In 2008, a system of multiple stations of a public instrument was very successfully demonstrated in *Play Me, I'm Yours*, also known as *Street Pianos*. For this project, British artist Luke Jerram arranged for 1,900 pianos to be set up in public places in over 60 metropolitan areas around the world, ranging from train stations to public parks to street corners. The pianos are painted and decorated by visual artists. Anyone, regardless of musical ability, is invited to sit at the piano and play.⁹

The piano was joined with visual imagery and music in Matthew Matthew's 2012 project, *On a Human Scale*. For this project, Matthew and his collaborators gutted a piano and swapped the analog musical components in favor of a system made of electronic parts. The electronic components connected to a computer and played short video clips, arranged in a grid on a projected screen. The clips themselves each featured an individual person singing a single note. Matthew shot these clips himself and linked each video to a corresponding key on the altered keyboard. A participant playing the interface would create a musical composition of human voices.¹⁰

A discussion about the piano as an electronic interface, however brief, would be incomplete without mentioning another project by David Byrne, called *Playing the Building*, from 2005. The keys of a vintage organ were connected to mechanical devices positioned throughout a building. There were four locations during the piece's tour: Färgfabriken in Stockholm, the Battery Maritime Building in New York, the Roundhouse in London, and Aria in Minneapolis. The piece utilized three

⁹ Street Pianos, "Play Me, I'm Yours | Street Pianos," accessed September 27, 2019, <http://www.streetpianos.com/>.

¹⁰ Sharp Stuff, "Matthew Matthew: On a Human Scale," *Medium*, November 13, 2012, accessed September 26, 2019, <https://medium.com/american-dreamers/matthew-matthew-on-a-human-scale-f0d36272d3db>.

types of interactions: wind (air would whistle through an architectural feature), vibration (a motor would shake an element of the building), and striking (a mechanical mallet would turn a piece of the building into a percussive device). Visitors of the exhibit were encouraged to sit at the organ and play the building like an instrument.¹¹

All three of these piano- and organ-based projects were able to utilize connectivity either explicitly or abstractly. For example, electric signals and mechanics were clearly central to *Playing the Building*. The installation itself makes every attempt to expose its innerworkings. In his original proposal for the project, Byrne says:

Switches that activate these machines are triggered by a simple keyboard located at a central position (within viewing distance of all the machines and of the pipes or beams whose vibration they control, so that visitors might hear what depressing each key does.)¹²

Visitors and participants can visually and conceptually connect cause and effect by following the wires from the organ to the and the machines that make the sound possible.

Like *Playing the Building*, Matthew's *On a Human Scale* demonstrates digital networking through its electronics and programming. Additionally, this happened during Matthew's process of gathering material. To populate his collection of notes, he filmed dozens of people in New York and Guadalajara, Mexico singing a single note. Matthew speaks of cooperation through a world-wide network: "[...] each of us contributes our own unique note to the scale, playing an equally important part in the greater harmonious experience—be it an instrument, a community, a symphony, or a global village."¹³ Building a musical collaboration across distance was clearly a motivation behind *On a Human Scale*.

Although *Play Me, I'm Yours* uses no obvious, physical electronic connectivity, it approaches networking through maps and written narrative. The website for the project features a map that allows people who visit the site to see where the project has happened.¹⁴ The website also provides a detailed map of individual cities in order to help visitors find a piano to play or to listen to. There is also a tab on the website that gathers stories surrounding the project from around the world.¹⁵

The previous three installations capitalize on the fact that everyone knows how a piano works. Even if a visitor did not know how to play a piano properly, he or she would still be welcome to play *with* the piano. Using an existing or well-known interface or format is a very effective method

¹¹ David Byrne, "David Byrne | Playing the Building," 2005, accessed September 27, 2019, <http://davidbyrne.com/explore/playing-the-building/about>; "David Byrne - Playing the Building at the Roundhouse," YouTube video, 2:46, posted by "Roundhouse," October 1, 2009, accessed September 27, 2019, <https://www.youtube.com/watch?v=UIIao7dji2M>.

¹² Byrne, "David Byrne | Playing the Building."

¹³ Matthew Matthew, "Matthew Matthew: On a Human Scale."

¹⁴ Street Pianos, "Play Me, I'm Yours | Street Pianos, <http://www.streetpianos.com/>.

¹⁵ *Ibid.*

of communicating the function of an interactive art piece. This clearly contributed to the success of all three of the above installations.

A project that subverted expectation while introducing a new way to build a soundtrack was the *ReacTable*. *ReacTable* debuted on YouTube in 2006.¹⁶ To create music with the *ReacTable*, users place colorful blocks (called “tangibles” by the *ReacTable* creators) on a circular surface backlit by a projector. Lines and relationships between the blocks are communicated through animated graphics projected onto the surface. The user receives real-time visual information that informs how one block influences another block. He or she can change the sound and rhythm by moving and twisting the tangibles. Although the custom interface was completely new at the time, the creators wanted it to be accessible. Among the goals of this project was an activation of both professional musicians and music producers and the novice/casual user.¹⁷ Since the project’s debut, the group has moved into the commercial/mass production realm and now produces the *ReacTable* for museums and hotels.¹⁸ In these public settings, several individuals can play with the *ReacTable* at once, encouraging connections and collaborations between people.

The examples up to this point have been musical, but I would like to conclude this section of the paper with a look at two pieces that do not rely on notes, rhythm, or audio compositions as output. The last two works discussed here require an extremely engaged audience member, and both works activate the viewer in unique ways.

In their 2001 piece, *Every Shot Every Episode*, Jennifer and Kevin McCoy embedded a small screen and DVD player into a series of hard plastic suitcases mounted onto the gallery wall. Underneath these media centers are rows of DVDs that contain small video clips of episodes of *Starsky and Hutch*. The episodes were split up into distinct moments such as “every zoom out” and “every stereotype.” This collection served as a database that is not catalogued or searchable in the digital sense. In order to find and play a moment or phenomenon from the popular 70s-era TV show, the gallery goer had to visually search through the row of DVDs and manually load the discs into the players.¹⁹ There is an overlap between Matthew’s *On a Human Scale* in that both installations make use of short distinct video tracks triggered by the participant. To a contemporary audience, the act of taking media out of a physical plastic case, placing into a player and then hitting the play button seems archaic. However, the physicality of *Every Shot Every Episode* draws attention to library-like quality of the piece (a row of discs on a shelf, a physical repository). Additionally, the physical format makes the viewer highly aware of the sheer amount of video clips.

As important as the discussion surrounding new media, networks, and video is, one may be drawn back to the simplicity and accessibility of the first project addressed in this paper: *Play Me*

¹⁶ “ReacTj - ReacTable Trance live performance #2,” YouTube video, 6:36, posted by “ReacTj,” November 12, 2009, accessed September 27, 2019, <https://www.youtube.com/watch?v=Mgy1S8qymx0&t=15s>.

¹⁷ Sergi Jordà, “ReacTable Kick Off,” 2010, accessed September 27, 2019, <http://mtg.upf.edu/node/1878>.

¹⁸ Reactable, “Reactable – Music Knowledge Technology,” accessed September 27, 2019, <https://reactable.com/>.

¹⁹ Paul, *Digital Art*, 101.

I'm Yours. The advantage of this piece is that the piano is physically and conceptually self-contained. There is no need for instructions, a docent, or any sort of prompting or explanations. The project does not even require electricity.

The analog autonomy of *Play Me I'm Yours* overlaps with Sheryl Oring's public performance project, *I Wish to Say*.²⁰ During performances of the project, Oring sits at a vintage typewriter and invites anyone to sit in front of her to dictate a postcard to the president (or the presidential hopeful of their choice in the event of an election year). Oring is often accompanied by a group of volunteers in the same "secretary" style role, allowing for several people to interact with the piece at once. The project has been ongoing since 2004 and has generated over 4,000 postcards. At the end of each performance period, these postcards are collected and mailed to the White House.²¹

Both within and beyond the confines set forth by this paper, *I Wish to Say* is an extremely successful project. Keeping within the agenda of this discussion, Oring's installation is very effective due its easy-to-interpret interface, scalability, ease of installation, open ended political agenda, its use of props and equipment, and the roles assumed by both the performers and the audience.

The interface itself involves a person sitting at a typewriter and often a printed sign or banner that invites passers-by to write a letter to the president. Although dictation is something that no longer happens very often in the contemporary American workplace, it is not a complicated or difficult-to-understand phenomenon. There is essentially no learning curve. Oring's format of several performers at multiple stations allows for a straightforward installation: performers simply show up with a typewriter, sit, and type, and the installation can be as big or small as Oring wishes. Additionally, the typewriter itself as a prop helps drive this interaction.

The aforementioned attributes all add to the overall accessibility of the work. Perhaps the most democratizing quality of the work is the fact that it invites *everyone* to sit and dictate a postcard, regardless of political affiliation. Although partisan sentiment is clearly conveyed by the participants, Oring and her co-performers do not express a specific partisan political agenda during the performance. The project is as a conduit for and an archive of participants' ideas and feelings. Once written, the postcards become a mirror for the participants themselves. The networking/community aspect of the work occurs during this process. Like *Play Me, I'm Yours*, the connectivity is not a digital one, but rather a social one.

I first became aware of *I Wish to Say* rather late—while working on *Video Voto Matic* in 2016. I was drawn to it as an exemplar of my own goals as an artist. Additionally, *I Wish to Say* has attributes (installation, interface, roles, etc.) that could be applied to projects within the realm of networked music. A conceptual crossover between performative networked music and analog public

²⁰ This paper is not the first appearance of the phrase "analog autonomy." See Mike Duff, "2018 Rolls-Royce Phantom: The Eighth Generation of Ultimate Luxury," *Car and Driver*, July 27, 2017, accessed September 27, 2019, <https://www.caranddriver.com/news/a15089356/2018-rolls-royce-phantom-photos-and-info-news/>.

²¹ Sheryl Oring, "I Wish to Say – Sheryl Oring," accessed September 27, 2019, <http://www.sheryloring.org/i-wish-to-say>.

performance art is a worthwhile topic, however, that topic is a part of larger conversation that is outside the scope of this paper.

Background of Diebold and Technical Information Concerning the Accuvote TS

Just the typewriter and the process of dictation serve Oring's project and the piano and piano-based performance serve that of Byrne, Matthew, and Jerram, I am examining the voting booth and the electoral process in my projects. The exact voting booth procured for the next stage of my studio endeavors, the Diebold Accuvote TS, has had a long and controversial history that infuses the voting process as well as the physical booth itself with an atmosphere of failure and mistrust. This exact system can be seen as the center point of larger, systemic problems within our electoral system.

Diebold and its voting products came to the forefront in 2002, the same year that Congress passed the Help America Vote Act, an initiative that discarded \$350 million into an outmoded voting system. Diebold, a corporation that had a history of producing ATMs and security systems, acquired an entity that produced screen-based DRE voting systems called Global Election Systems. This new segment of the company was named Diebold Election Systems.²² Georgia was one of the first states to make a substantial investment in a new voting structure by adopting the screen-based Diebold Accuvote TS system statewide, also in 2002.²³

The Diebold Accuvote TS system is an example of a Direct Recording Electronic Voting System (DRE). According to Paul S. Herrnson et al., DREs "record votes electronically and do not involve a paper receipt or ballot at any point of the process."²⁴ Herrnson, his collaborators, and a cadre of other researchers who have studied voting and voting systems make a recommendation that voting machines have at least one paper roll that keeps track of votes in the event of an electronic failure or recount. Ideally, a second printed roll should also be utilized as a takeaway "receipt" for the individual voters, similar to the paper receipts dispensed at ATMs. Random audits of the machines during election day were also recommended. There is also an advantage to creating a

²² M.R. Kropko, "Diebold Weighs Strategy for Voting Unit," *WIRED*, Associated Press, March 9, 2007, accessed September 27, 2019, https://web.archive.org/web/20070309174255/http://hosted.ap.org/dynamic/stories/D/DIEBOLD_VOTING?SITE=WIRE&SECTION=HOME&TEMPLATE=DEFAULT.

²³ Ellen Nakashima, "In Georgia, a legal battle over electronic vs. paper voting," *Washington Post*, September 16, 2018, accessed September 26, 2019, <https://www.washingtonpost.com/world/national-security/in-georgia-a-legal-battle-over-electronic-vs-paper-voting/2018/09/16/d655c070-b76f-11e8-94eb-3bd52dfe9>.

²⁴ Paul S. Herrnson et. al., *Voting Technology: The Not-So-Simple Act of Casting a Ballot* (Washington, DC: Brookings Institute Press, 2008), 10.

system completely offline (no easily accessed removable media slots or network connections) that has open source code that can be checked on a website by the coding community.²⁵

In order to understand the flaws of the Diebold Accuvote TS, it is important to know how the machine actually works. In order to use the Accuvote TS, a poll worker hands the voter a card with a coded magnetic strip. The voter inserts the card into the Accuvote. The machine is unlocked and will accept selections from one voter. An LCD touchscreen displays choices for various offices and/or policies, and the voter navigates through a series of screens containing various offices, candidates and/or issues that are specific to the election year. After the voter votes by touching boxes next to their preferred candidates or referenda, he or she touches a “cast vote” button, and the machine stores the vote. The voter removes the card and hands it back to the poll worker who then resets the code on the magnetic strip on the card for the next voter.²⁶

Not long after Georgia’s adoption of the Accuvote TS, a group of researchers procured an Accuvote TS in an attempt to test its vulnerabilities. They conducted their tests in 2003 and published their findings soon afterwards; according to their findings, there were many hardware- and software-based weaknesses. The Diebold Accuvote TS runs on Windows CE, and it can be booted up to run on regular Windows, an obviously accessible operating system.²⁷ During the time of the study, Diebold employees had placed the entirety of the source code on a public FTP site, inadvertently giving *anyone* access to the code.²⁸ If a hacker could gain access to the source code, he or she could alter it, load it onto a removable memory card, and place that device into one of the removable media slots in the back of the machine. Malware can also be loaded on the magnetic cards that unlock the machines for voting. The Accuvote also be hacked by soldering a computer chip on the mother board. Even if a hacker could not get access to the source code and alter it, a simple virus could crash the entire computer, taking it out of service. The researchers found that the machine’s casing could be opened with the same kind of key that opens office furniture, jukeboxes, and mini bars. A hacker could also carve a copy from taking a close look at a high-resolution photo of working keys posted on the Diebold online catalog. Any single of the above hacks could result in stolen votes, lost votes, or a machine that is jammed or erased.²⁹

²⁵ Ibid., Ariel J. Feldman, Alex Halderman, and Edward W. Felten, “Security Analysis of the Diebold AccuVote-TS Voting Machine,” in *Proceedings from 2007 USENIX/ACCURATE Electronic Voting Technology Workshop (EVT’07)*, (September 13, 2006), 2; Tadayoshi Kohno et al., “Analysis of an Electronic Voting System,” in *Proceedings of the 2004 IEEE Symposium on Security and Privacy*, (IEEE, 2004): 27.

²⁶ Ibid., 29.

²⁷ Ibid.

²⁸ Alex J. Halderman, “Practical Attacks on Real-world E-voting,” in *Real-World Electronic Voting*, ed. Feng Hao and Peter Y. A. Ryan (Boca Raton: CRC Press, 2017), 148.

²⁹ Feldman, “Security Analysis of the Diebold AccuVote-TS Voting Machine,” 2-4; Kohno et al., “Analysis of an Electronic Voting System,” 29-34.

The Accuvote TS and the Bigger Picture

The Diebold Accuvote TS machine itself is only one variable within an entire organization that has malfunctioned. The machine and its Ohio-based manufacturer have been centerstage in inappropriate dealings with state voting officials in Ohio and Georgia. In the early 2000s, an individual working on behalf of Diebold gifted \$50,000 to the “political interests” of then-Ohio Secretary of State J. Kenneth Blackwell.³⁰ A few years later, it was revealed that Blackwell had owned Diebold stock at the time. During this time period, then-Diebold Executive “Wally” O’Dell hosted fundraising events at his home and went so far as to writing a letter stating that he aimed to help “Ohio deliver its electoral votes to the President.”³¹ “The President” was a reference to George W. Bush, who was running for re-election at the time. O’Dell was also a member of an elite fundraising group of people who pledged more than \$100,000 to the Bush Campaign.³²

In 2008, Diebold began to distance itself from the voting machine industry in the US, first by changing the name of its voting arm to Premiere Election Systems. In 2009, Diebold sold the entirety of Premiere Election Systems to Election Systems and Software, Inc. (ES&S), based in Omaha, Nebraska.³³ In 2010, competing voting booth manufacturer Dominion purchased ES&S as part of antitrust legislation.³⁴

Georgia in 2018

The controversies in Ohio may seem like old news, but the Diebold Accuvote TS was utilized by Georgia continuously from its adoption in 2002 up until last November in the 2018 Georgia Governor Race between Stacy Abrams and Brian Kemp. This contest and the voting machine were plagued by controversy. In the years leading up to the 2018 governor’s race and during the race itself, Brian Kemp had been serving as the Secretary of State. Although overseeing elections is one of the duties as Secretary of State, he did not recuse himself from this particular responsibility and proceeded to supervise his own election.

³⁰ Bob Fittrakis, “Diebold Indicted: Its spectre still haunts Ohio elections,” *Columbus Free Press*, October 31, 2013, accessed September 17, 2019, <https://columbusfreepress.com/article/diebold-indicted-its-spectre-still-haunts-ohio-elections>.

³¹ *Ibid.*

³² *Ibid.*

³³ “Diebold Exits Voting Machine Business,” *CBS News*, September 4, 2009, accessed September 16, 2019, <https://www.cbsnews.com/news/diebold-exits-voting-machine-business/>; “Diebold May Sell Off E-Voting Arm To Stave Off Bad Publicity,” *The Associated Press*, March 5, 2007, accessed September 27, 2019, <https://rcpmag.com/articles/2007/03/05/diebold-may-sell-off-evoting-arm-to-stave-off-bad-publicity.aspx>.

³⁴ “Dominion Voting Systems, Inc. Acquires Premier Election Solutions Assets From ES&S,” *Business Wire*, May 10, 2010, accessed September 27, 2019, <http://www.businesswire.com/news/home/20100520005590/en/Dominion-Voting-Systems-Acquires-Premier-Election-Solutions>.

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There were more instances of questionable actions from the office of the Secretary of State during the 2018 race. A software developer had logged onto the Georgia voter website to check his registration, only to find that all voters' information was completely vulnerable. He notified the Georgia Democratic Party, which in turn attempted to alert the state government. Brian Kemp responded by launching an investigation into potential hacking by Democrats without securing proper evidence.³⁵ After securing the Governor's office, Kemp appointed a former ES&S lobbyist to the office of deputy chief of staff.³⁶

The office of former Secretary State Brian Kemp was sued twice by voting rights activists concerned about voting security and effectiveness in Georgia—once in 2017, and again in 2018. One of the concerns voiced by the groups was the use of the dated Accuvote TS voting machines and its lack of a printed auditing system.³⁷ These two suits did not result in a change of voting machines in time to be rolled out for the 2018 Georgia governor's race, but a Federal Judge ruled in 2019 that Georgia must update its voting system (finally getting away from the Diebold Accuvote TS) or go back to using only paper for its next election. Since this ruling, Georgia has voted to adopt a paper-backed system from voting booth manufacturer Dominion.³⁸ This is a welcome change, but the real failure is that the notorious Diebold Accuvote TS was in use for 16 years and served as the centerpiece of a failed system.

There are still 4 states that use DREs entirely: Delaware, Louisiana, New Jersey and South Carolina.³⁹ With proper auditing and backups, electronic voting can be successful and actually instill

³⁵ Benjamin Freed, "Georgia has not followed good election security practices, cyber expert says," *StateScoop*, December 17, 2018, accessed January 9, 2019, <https://statescoop.com/georgia-has-not-followed-good-election-security-practices-cyber-expert-says/>.

³⁶ Jordan Wilkie, "'They think they are above the law': the firms that own America's voting system," *The Guardian*, April 23, 2019, accessed September 27, 2019, <https://www.theguardian.com/us-news/2019/apr/22/us-voting-machine-private-companies-voter-registration>.

³⁷ Colorado Springs Gazette, "Georgia voters, Colorado nonprofit sue to overturn special election results in Georgia's 6th Congressional District;" "Common Cause, the National Election Defense Coalition and Protect Democracy Support Legal Challenge to Georgia's Insecure Voting System," *Targeted New Service*, July 17, 2018, accessed January 7, 2019, <https://search-proquest-com.ezproxy.monmouth.edu/docview/2071206033?pq-origsite=summon>.

³⁸ "Federal Judge Affirms that Georgia's Failure to Secure Election System Violates Voters' Constitutional Rights," *Common Cause Georgia*, September 22, 2018, accessed January 9, 2019, <https://www.commoncause.org/georgia/press-release/federal-judge-affirms-that-georgias-failure-to-secure-election-system-violates-voters-constitutional-rights/>; Mark Niese, "New Georgia voting machines win final vote in state House," *The Atlanta Journal Constitution*, March 14, 2019, accessed September 18, 2019, <https://www.ajc.com/news/state--regional-govt--politics/new-georgia-voting-machines-win-final-vote-state-house/twQCxrn1Cy9bFbLcUEwTlN/>; Mark Niese, "Georgia awards contract for new election system," *The Atlanta Journal-Constitution*, July 30, 2019, accessed September 18, 2019, <https://www.ajc.com/news/state--regional-govt--politics/georgia-awards-contract-for-new-election-system-dominion-voting/tHh3V8KZnZivJoVzZRLO4O/#>.

³⁹ Andrea Córdova, Liz Howard, Lawrence Norden, "Voting Machine Security: Where We Stand Six Months Before the New Hampshire Primary," *Brennan Center for Justice*, August 13, 2019, accessed September 16, 2019, <https://www.brennancenter.org/analysis/voting-machine-security-where-we-stand-six-months-new-hampshire-primary>; Lawrence Norden and Wilfred U. Codrington III, "America's Voting Machines at Risk – An Update," *The Brennan Center for Justice*, March 8, 2018, accessed September 18, 2019, <https://www.brennancenter.org/analysis/americas-voting-machines-risk-an-update>.

confidence among voters. On a lighter note, in a test by Herrnson et al., screen-based systems (including the Accuvote itself) scored high in the category of “Voter Confidence.”⁴⁰ Recently, DARPA has invested \$10 million in creating voting software and an interface that is impervious to hacking, backed by a paper trail, and is easy for the voter to navigate. The DARPA prototype appeared in the voting village at the hacker conference DEFCON and seemed to have held its own against hackers eager to find and expose potential weaknesses.⁴¹

The Diebold Accuvote TS system embodied a breakdown of the democratic process. It has no built-in auditing via paper or random checks. Its manufacturer had been embroiled in scandals including questionable affiliations between political officials and corporate executives. Its use of privatized/proprietary software and hardware has further obfuscated attempts at auditing. Its support systems at the state level have had serious voter data security issues. State government officials responsible for the Diebold system’s use have been the subject of various legal filings.

Future Projects

As an artist with the intent of harnessing voting booths as a musical/video interface, I find myself facing several challenges. There are several aspects of *Video Voto Matic* I would like to carry forward: a digital graphic user interface that counts off a 16-beat loop, videos from presidential candidates from debates and news footage, and musical and rhythmic elements as output. After spending time discovering and experiencing the work of like-minded artists as well as researching the events, climate, and policies surrounding the Diebold Accuvote TS, my goals for the next project are:

- Ease of use. The participant should be able to understand how to use the stations with a minimal amount of explanation.
- Coordination or networking between stations. Specifically, the stations should share a tempo.
- A clear reference to and parody of the Diebold Accuvote TS. The interface and voting screen should look a lot like the Accuvote.
- Expanded functionality that goes beyond percussion. The new patches will be able to create basslines, voice samples, and a melody.
- Sharing of information about voting security. This installation has the opportunity to inform the people who interact with it.

⁴⁰ Herrnson et. al. *Voting Technology*, 123.

⁴¹ Lily Hay Newman, “Hackers Take on Darpa’s \$10 Million Voting Machine,” *Wired*, August 9, 2019, accessed September 18, 2019, <https://www.wired.com/story/darpa-voting-machine-defcon-voting-village-hackers/>.

Voting Booths and Interactive Art Installations: The Diebold Accuvote TS in Context 13

- Empowering the user as a media consumer. Each booth will have a screen that outputs the remix of the video. Hopefully the viewer moves from a passive watcher of footage to someone who controls it.

As *Electo Electro 2020* is a work in progress, I am in the process of resolving the issues listed above. I have found that projects such as this one benefit from an individual acting as a docent or serving in the role of facilitator. Using the Max MSP Jitter workflow, coordinating the tempo of the stations and the added functionality can be accomplished within the patch itself. The stations themselves are actual Diebold Accuvote TS cases. An iMac and iPad will be embedded in each station in a housing that will mimic the beige Accuvote computer. The iPad interface will resemble the Diebold screens. While accompanying the installation of *Video Voto Matic* at various sites in 2016, I found that most users find the experience to be enjoyable, regardless of their political affiliation.

The Diebold Accuvote TS has been a symbol of mistrust and failure and *Electo Electro 2020* must walk a fine line between parody and empowerment. On the one hand, there is a very frightening reliance on technology within our democratic process. Social media, and the data it harvests clearly constitute the most invasive technological practice. The voting process seems like an opaque, impervious process where one person's vote disappears into a void. On the other hand, there is an opportunity to discuss mistakes of the past as well as hope for the future. I return to the results of the voter confidence study conducted by Herrnson and his colleagues that found that voters actually feel a certain level of assurance after voting on a computerized, screen-based system.⁴²

The final step to this process would be solidifying the community aspect of the work. I plan to reach out to organizations that deal with voter registration/voter education/voter rights such as the Brennan Center, Rock the Vote, or the ACLU. Another prospective collaborator is the Monmouth University Polling Institute. This partnership would potentially allow the voting booths to harness polling data as a means to produce video or sound. An additional challenge is finding a way to share the research presented in this paper. *Video Voto Matic* did this via a printed ballot. Perhaps the new project can utilize some sort of small booklet. An installation of this project could also be accompanied by a reading table or shelf with the research. Discussions of voting and voting rights will hopefully occur during installations of *Electo Electro 2020*.

There is an opportunity to combine concepts and practices from Network Music Performance with a public practice agenda. Network Music Performances rely heavily on technology and speed to guarantee a lack of delay or latency, resulting in a cohesive, performative and collaborative environment.⁴³ There is something alongside the bits and signals running through the wires between performers; there is also synchronicity and a common goal, a shared creative output. The

⁴² Herrnson et. al. *Voting Technology*, 123.

⁴³ Cristina Rottondi, et al., "An Overview on Networked Music Performance Technologies," *IEEE Access* 4, (2016): 8823.

coordination of the stations within the proposal for *Electo Electro 2020* should bolster the very same collaboration between individual visitors to the installation. A simple ethernet cable connecting iMacs running a custom Max MSP Jitter patch can have the ability to transform a group of solitary stations into small ensemble. Through networking tempos, a participant hopefully considers how his or her contribution is a small part within a larger orchestration, symbolic of how a single voter is a small contributor to the democratic process. This process is often a chaotic, and an unpleasant one, especially considering the current times. In the end, however, when all the votes fall into place, the process is orchestrated.

For further inspiration and guidance, I look to how Byrne, Jerram, Matthew, and Oring encouraged connections and community among participants. The shared experience of the piano pieces by Byrne, Jerram, and Matthew build on a familiarity with the physical piano keyboard. The advantage that these three works have over others is that this familiarity reaches backward in time, a scope that predates the production of all pieces. This is a community that has essentially existed since the invention of keyboard-based instruments. For Oring, the use of the typewriter and the social contract that exists between the person speaking (on orator) and the person recording his or her words (a scribe) also invokes a very old relationship. When visitors step into any of the installations from these artists, they instantly understand the interface and these associations.

Electo Electro 2020 will also tap into a social act: voting. However, the bond between a voter and the voting machine or that between individual voters is not as tangible or long-standing as the bond between a performer and the piano, or between spoken words and a means of recording those words. It takes a considerable amount of time to take and receive dictation. Playing or listening to a piano concert also time intensive. These points are true especially in comparison to how long and how often a person is in physical contact with a voting booth. Voting happens at most once a year (usually every other year for national elections), and the process takes but a few minutes.

This will be another challenge for the project: how can the installation and its support media arouse a feeling of connection between the participant, the physical device, and its use of video and audio media? The project relies heavily on timing and context. Timing the installation to coincide with the presidential election cycle fosters interest in discussions surrounding news media and polling. Where Oring, Byrne, Jerram, and Matthew build upon and encourage a person's previous experience with a piano or typewriter and subvert expectation through output (Oring uses the postcards to send messages directly to the White House, and the others create unique environments or sounds), the *Electo Electro 2020* project must take the short, binary act of voting (Republican or Democrat; yes or no) and transform it into an extended, exploratory, and creative exercise. This could happen when the visitor realizes that he or she can produce a custom music/audio track. The video and news footage will also refer to current stories and events in the media, encouraging interest and sparking discussions.

The most important potential outcome of the proposal is a new perspective on the part of participants. They should gain a greater understanding of the fragility of the voting process and issues surrounding voting and voting technology. They should feel encouraged to start and continue conversations about these topics. The time spent at the installation should result in an empowerment of the viewer, as the Accuvote TS voting booth itself is transformed from a symbol of failure to a fun and functional audio/visual interface and a tool for creativity. There have been many success projects that combine music, video, sculptural objects, performance, and politics. It is my hope that my projects add a worthwhile contribution to that discussion.

Appendix A:



Figure 1: Diebold Accuvote TS



Figure 2: VideoVotoMatic, 2016, vintage voting booth, iMac, 3D printing, custom software, dimensions variable.⁴⁴

⁴⁴ To see a video of the project, visit “Video Voto Matic (updated documentation),” YouTube video, 2:00, posted by “M Richioso,” October 9, 2016, accessed September 27, 2019, <https://www.youtube.com/watch?v=reiEx4DFDhA>.



Figure 3: VideoVotoMatic, 2016, vintage voting booth, iMac, 3D printing, custom software, dimensions variable.⁴⁵

⁴⁵ To see a video of the project, visit “Video Voto Matic (updated documentation),” YouTube video, 2:00, posted by “M Richioso,” October 9, 2016, accessed September 27, 2019, <https://www.youtube.com/watch?v=reiEx4DFDhA>.

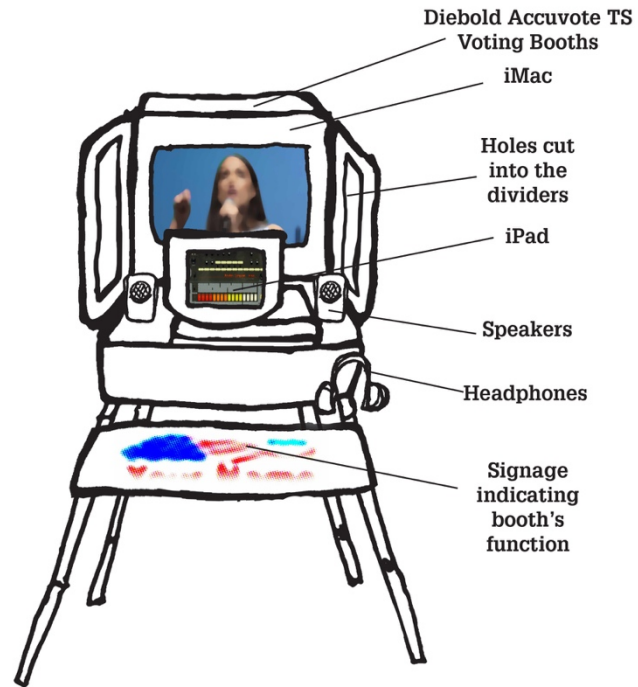


Figure 4: Electro Electro 2020 Concept Sketch

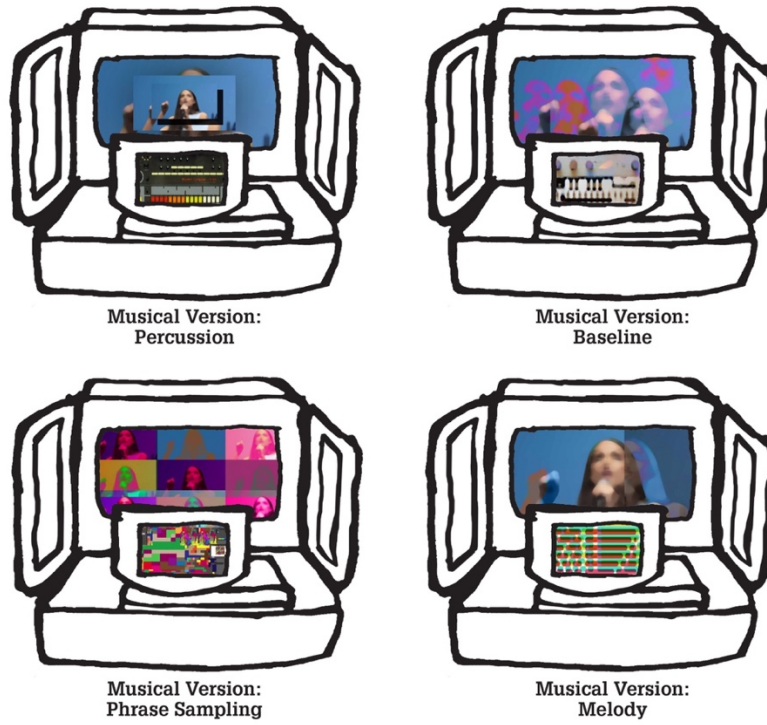


Figure 5: Electro Electro 2020 Concept Sketches

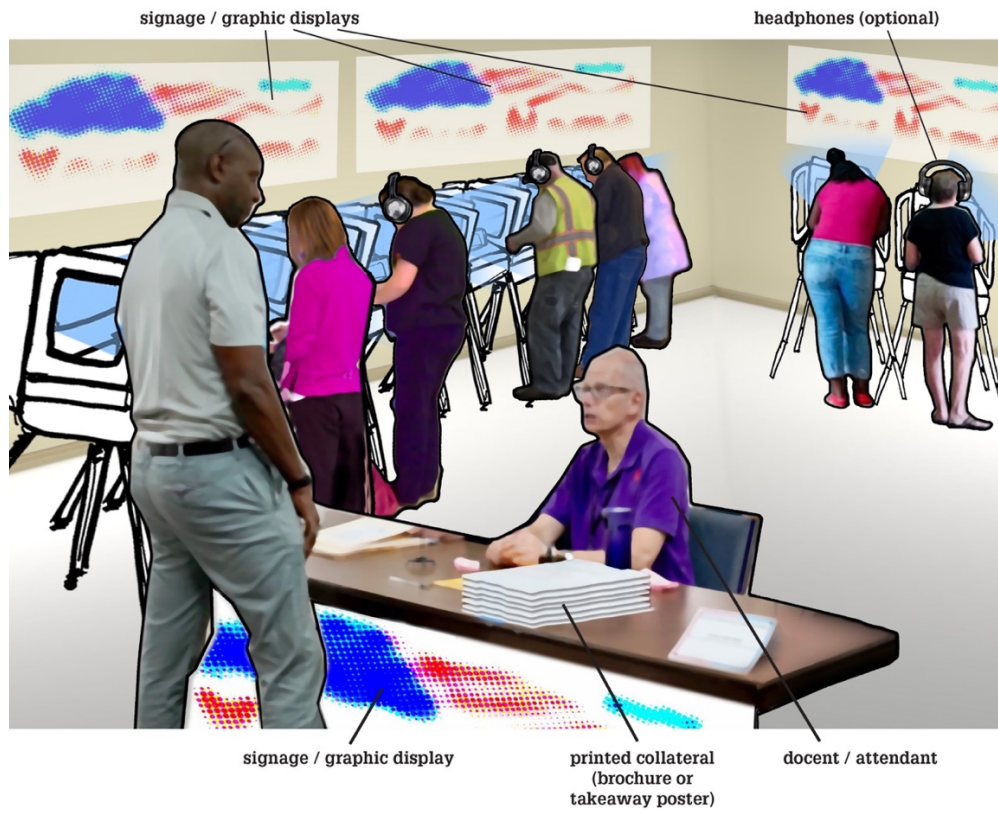


Figure 6: Electro Electro 2020 Concept Sketch

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Abstract

In 2016, I created an interactive installation called *Video Voto Matic*. This project was a mashup between the Votomatic voting system and a Roland TR-808 drum machine. To coincide with the 2020 election season, I am currently working on an update of the project that will include a touch screen voting interface and multiple networked stations that also produce audio and video output. The interface will be housed in the same voting booths that once housed the Diebold Accuvote TS. The Diebold Accuvote TS is a screen-based voting machine that does not utilize paper as a backup. Researchers have examined it and have determined that it is easy to hack. They have also made several recommendations to improve security and accountability in voting machines. In addition to the many security flaws, the Accuvote has a long and controversial history. This paper will also discuss preceding interactive art installations that involve networking, unique user interfaces, and

high levels of audience engagement—specifically, works from David Byrne, Matthew Matthew, Luke Jerram, the ReactTable team, Jennifer and Kevin McCoy, and Sheryl Oring.