Surveying the Humanities MakerLab Movement

a report by

Isabella Viega, Ryan Cordell, and Kyungwon Koh

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Outline of Sections

1. Introduction

While most conversations about data in the humanities focus on what we can analyze and present on screens, increasingly scholars turn to critical making and fabrication to investigate history and culture. Museums 3D print artifacts for patrons, students, and researchers to study in embodied ways that might be difficult with rare, fragile, or inaccessible originals. Researchers create data physicalizations to convey the scale or contours of datasets in ways impossible in two dimensions, or to make datasets more accessible to diverse audiences. Over the past decade, a growing community of scholars in book history, media studies, libraries, and digital humanities have begun creating hybrid spaces for experiential teaching, learning, and research using historical media and technology, from letterpress printing to vintage computing. Unlike parallel maker movements in other disciplines, however, where conferences, publications, and professional organizations exist, the full network of humanities makerspaces has not been well described or theorized.

Humanities maker labs, centers, spaces, and initiatives are diverse in origins, departmental homes, and included technologies, but they share conviction that understanding complex histories of information technology will prove key to developing more equitable and humane information technologies for the future, as well as a commitment to embodied research that cultivates technological innovation and imagination beyond the digital alone.[1] They champion the value of hands-on experience for both learning and discovery, and posit "reflective design as a means of establishing alterity relations and working toward technological fluency."[2] In other words, even as much of research and knowledge production has gone digital in the twenty-first century, students and scholars have come to crave haptic experience and embodied modes of learning, while the need to reach back and recover earlier media and modalities seems particularly acute. The "maker turn" in the humanities in some ways mirrors the rapid expansion of campus and community maker spaces in STEM research and education, where the value of hands-on experimentation and prototyping have been well established.[3] Humanities researchers and students recognize that experiential learning will be central to the future of their disciplines.

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[1] C.f. Ryan Cordell, Benjamin Doyle, and Elizabeth Hopwood, "Kaleidoscopic Pedagogy: The Idea of a C19 Classroom Laboratory" In *Teaching with Digital Humanities* (2018); Paul Fyfe, "Reading, Making, and Metacognition: Teaching Digital Humanities for Transfer," *Digital Humanities Quarterly* (2018); or Courtney Jacobs, Marcia McIntosh, and Kevin M. O'Sullivan, "Making Book History: Engaging Maker Culture and 3D Technologies to Extend Bibliographical Pedagogy, *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage* (2018).

[2] Charity Hancock, Clifford Hichar, Carlea Holl-Jensen, Kari Kraus, Cameron Mozafari, and Kathryn Skutlin. "Bibliocircuitry and the Design of the Alien Everyday," *Textual Cultures: Texts, Contexts, Interpretation* 8:1 (2014).

[3] David Staley, "On the 'Maker Turn' in the Humanities," in *Making Things and Drawing Boundaries* (Univ Of Minnesota Press, 2017).

2. Defining a "Humanities Makerspace"

While this whitepaper often utilizes the 'makerspace,' 'makerlab' and 'maker initiative' interchangeably, each term carries epistemological baggage. Although the distinction between 'makerspace' and 'makerlab' might appear trivial, the movements and traditions in which these humanities initiatives situate their pedagogical approaches bears discussion. Terms do, in fact, matter: what kinds of resources, communities, and opportunities might a 'booklab' garner that a 'letterpress studio' might not? What kinds of activities do these labels signal, especially to university administrations and government funding bodies?

This discussion of nomenclature necessitates a return to the broader movements that surround these humanities-oriented makerspaces and labs: namely, the Maker Movement and fabrication labs. Chris Anderson explores how the Maker Movement "started as a cultural shift—a fascination with new digital prototyping tools and a desire to extend the online phenomenon into real-world impact"—but now the Maker Movement "is now starting to become an economic shift, too."[4] Throughout the past few decades, the Maker Movement has become an emblem of industry, evolving from counterculture DIY spaces to government-funded sites of entrepreneurship. Anderson defines the Maker Movement in terms of the internet: "the power of 'network effects,'" he argues, permits people and ideas to connect and flourish, acting as a material simulacrum of the immaterial World Wide Web.[5] Certainly, Neil Gershenfeld establishes fabrication as a "return to our industrial roots" and highlights "the analogy between the personalization of fabrication and computation," going as far as to establish the rise in critical making as a "digital revolution in fabrication."[6]

Anderson explicitly connects the Maker Movement with empire: "Any country, if it wants to stay strong, must have a manufacturing base. Even today, about a quarter of the U.S. economy consists of the manufacturing of physical goods." Considering that Anderson writes in the midst of Obama-era funding of makerspaces, his imperialist framing still haunts makerspaces over a decade later. He discusses how the outsourcing of labor to countries in the Global South "has made it harder and harder to keep manufacturing industries going in the rich countries of the West," citing the Maker Movement as a panacea to the rising costs of labor *and* the globalization of labor. Certainly, one might

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[4] Chris Anderson, *Makers: The New Industrial Revolution* (Random House Business Books, 2013), 19.
[5] Anderson, 21.
[6] Neil Gershenfeld, *Fab: The Coming Revolution on Your Desktop—From Personal Computers to Personal Fabrication*, (Basic Books, 2005), 8-10. See Gershenfeld's *Designing Reality: How to Survive and Thrive in the Third Digital Revolution* (Basic Books, 2017), where he expands on these ideas further .

interrogate why higher-education institutions and the government invest money into the Maker Movement—and how humanities initiatives might participate in, or perhaps subvert, these investments.[7]

On the other hand, the founding of fabrication labs in the United States can be traced to MIT in the 1990s and 2000s: Neil Gershenfeld describes his experiences teaching a course entitled, "How To Make (almost) Anything" in 1998, which revealed a dearth in students' technical experience while simultaneously showcasing their desire for hands-on making—not just for professional development, but also personal development. The National Science Foundation (NSF) funded the early 'fab labs' that emerged from these MIT faculty members' work, and these spaces began to appear globally as early as 2002. Gershenfeld articulates the connection to fabrication to contemporary technologies rooted in the digital while affirming an intentional return to the material world: "We've had a digital revolution, but we don't need to keep having it. Personal fabrication will bring the programmability of the digital worlds we've invented to the physical world we inhabit."[8] In most fab labs across higher education institutions, one can find a variety of tools to facilitate projects across digital and analog creation, from desktop computers with myriad software to 3D printers to laser cutters to sewing machines to button makers. Although the early fabrication initiative finds its roots in both physical and computer sciences byways of the Center for Bits and Atoms (CBA), fab labs in the subsequent decades have expanded to serve not only STEM disciplines, but also the arts and humanities. In some instances—as in the case of the Champaign-Urbana Community Fab Lab—fab labs serve a range of disciplines, as well as people outside of the host institution, and explicitly seek to bring together artists and technologists.

3. Overview of the Research Project and Process

"Surveying the Humanities Maker Lab Movement" (hereafter SHMLM) studied the recent growth of humanities-focused makerspaces in US higher education institutions, identifying commonalities across disciplines, technologies, and organizational structures. The study included literature review, surveys, interviews, and site visits. For the purposes of the study, we define a humanities makerspace as:

1. a physical location, whether dedicated or shared, housing distinct tools or technologies for use;
2. which has a research and/or pedagogical mission grounded in a humanistic discipline (e.g., literature, history, religious studies, libraries); and

[7] Anderson, 23.
[8] Gershenfeld, 17.

3. which facilitates hands-on, experiential, participatory approaches to research and/or teaching. This definition is purposefully broad, in hopes of capturing a wide range of activities which may or may not see themselves as related, but which we believe could productively be placed in conversation.

As we discuss in more detail later in this report, not all initiatives surveyed in SHMLM identify themselves as makerspaces, though they fit our criteria above. Note that humanities makerspaces conceptualized in this study are distinguished from a print lab housed in an art department. While the objects created in both might echo and overlap, humanities makerspaces often include in their goals developing understanding of historical processes and labor.

Our team recruited interview participants by creating a survey and distributing it to relevant makerspace and adjacent networks via social media and mailing lists. After collecting the initial survey data, we invited the managers or directors of approximately ten makerspaces to participate in hour-long interviews, which were conducted over Zoom throughout the Spring and Summer 2023 semesters. These ten makerspaces all facilitate humanities research and pedagogy, although their tools and approaches differ: several makerspaces feature fabrication technologies common to the larger maker movement (e.g. 3D printers, laser cutters, electronic prototyping kits), while others focus on textile technologies (e.g. sewing machines, looms), bookmaking technologies (e.g. printing presses, bookbinding) or vintage computing (e.g. computers, gaming systems, typewriters). The managers and directors of these labs teach and conduct research in a variety of different departments and settings, including English, Information Science; Digital Humanities; Literatures, Cultures, and Languages; and libraries. Table 1 below presents information about each makerspace in this study, which can also be found in the Appendix.

Table 1. Humanities makerspaces that participated in this study

Makerspace	**Institution**	**Department(s)**	**Technologies**
Blue Satellite Press	Millikin University	English	Letterpress/printing
BookLab	University of Maryland	English	Papermaking, letterpress/printing, book binding, zine making, textiles, 3D modeling/historic reproduction, gaming/game design

Digital Humanities Initiative	Santa Clara University	College of Arts and Sciences	Letterpress/printing, bookbinding
Maker Lab	University of California, Santa Barbara	English	Letterpress/printing, 3D modeling/historical reproduction
Makerspace	NC State University	Library	Textiles, wearable technology, 3D modeling/historical reproduction, VR/AR/immersive environments, 3D printing, CNC milling, laser cutting, physical computing
Media Archaeology Lab (MAL)	CU Boulder	College of Media, Communication and Information	Vintage computing, gaming/game design, textual technologies, audio-visual
Scarlet Letterpress	Rutgers University	English	Papermaking, letterpress/printing, book binding, risograph/mimeograph
Skeuomorph Press & BookLab	University of Illinois Urbana-Champaign	School of Information Science	Letterpress/printing, zine making, risograph/mimeograph, vintage computing
Text Technologies Press	University of Wisconson-Madison	Information School	Textiles
Textiles Makerspace	Stanford University	Division of Literatures, Cultures and Languages	Paper making, letterpress/printing, book binding
TinkerTank, Scholars' Lab	University of Virginia	Library	Letterpress/printing, zine making, risograph/mimeograph, textiles, wearable Technology, vintage computing, 3D modeling/historical reproduction, gaming/Game Design, VR/AR/Immersive Environments, electronics, resin casting

All interviews were recorded, transcribed, and imported into Dedoose, a qualitative data analysis software. The analysis process included multiple rounds of coding: the researchers processed the data and allowed themes to emerge organically before organizing these themes into more cohesive patterns.

In the Fall 2023 semester, our researchers also traveled to three makerspaces to conduct in-person interviews and collect supplemental data: the Center for the Book at the University of Iowa, the Scarlet Letterpress at Rutgers University, and the Media Archaeology Lab at CU Boulder. These site visits allowed us to witness day-to-day operations and learn from a wider range of users, including the students and community members who research, teach, and create in these labs. Our goals for on-site visits were broad; we sought to gain a qualitative sense of each location's presentation and affective environment.

The primary goal of SHMLM is to better articulate the motivations, philosophies, structures, missions, and challenges of disparate initiatives arising in a shared moment and responding to similar institutional structures, pedagogical mandates, and turns in research methodologies. As the founders and directors of Skeuomorph Press at the University of Illinois Urbana-Champaign, we are participant-researchers in this study. To that end, SHMLM hopes also to provide a resource that will help humanities makerspaces articulate the value of their work and advocate for their roles in their departments and institutions.

4. Major Themes

SHMLM identified the following key themes across the project's interviews and site visits. These themes should not be construed as comprehensive nor ubiquitous. Some ideas emerged in particular discussions which are not reflected here, while most of these themes did not emerge in every project interaction. Instead, these themes are our synthesis of ideas we heard reflected across multiple interviews or interactions. We believe they represent shared goals and ideals that link these disparate initiatives, and which might help existing and nascent humanities makerspaces articulate their missions, values, and contributions to their respective communities.

4.1. Perceptions of Humanities Makerspaces in the Maker Movement

The investigators asked interviewees about their initiatives' connection with the contemporary Maker Movement, and responses varied: some initiatives highlighted the institutional support that comes along with the makerspace designation, while others shied away from the connotations that connect the word "maker" with STEM and tech/corporate culture. Others acknowledged that their spaces did not have any formal connections with the Maker Movement due to their focus on day-to-day operations and maintenance of their spaces.

Matthew Kirschenbaum states that "BookLab is the Maker Movement for English majors and book people and humanities folks," highlighting how this framework creates a "mutually reinforcing" relationship with the University of Maryland's Makerspace Initiative. Indeed, several participants commented on the institutional resources and community-oriented collaboration that stems from the 'makerspace' label: Quinn Dombrowski discussed how the Textiles Makerspace participates in Stanford University's network of makerspaces by attending meetings, participating in events, hosting tours, sharing resources, and lending expertise. When a makerspace in the Engineering department needed assistance with newly acquired textile technology, for example, the directors/managers identified Dombrowski as a resource because of this established network. Kirstyn Leuner similarly identified the Digital Humanities Intiative's letterpress studio at Santa Clara University as a makerspace: "We're definitely doing makerspace things, and we have a makerspace vision of interdisciplinarity and, I would say, broader community engagement." Leuner established this initiative as "outwards-facing and engaging," aligned with SCU's commitment to community-oriented education; she also discussed how the letterpress studio collaborates with another makerspace on campus. Likewise, the SHMLM authors' space, Skeuomorph Press, is located within the CU Community FabLab and frequently coordinates with the FabLab's events and initiatives, while collaborating on classes and projects.

However, not all interview participants identified with the Maker Movement, nor did they situate their initiatives as 'makerspaces.' During an interview about the Text Technologies Press at the University of Wisconsin-Madison, Jonathan Senchyne admitted a hesitancy around the contemporary framing of the Maker Movement, stressing the discrepancy between working-class tinkering out of necessity and the privatization of fabrication. He described how the STEM-washing of commercial movements feels incongruous with the movement's roots: "When did this become profitable? When did this become something people want to invest in, and why?" Senchyne began to answer these pressing questions by connecting the commercialization of 'making' to the rhetoric of the Republican party in the 2012 election, which demonstrates the political model of makerspaces. libi rose striegl, manager of the Media Archaeology Lab at CU Boulder, similarly emphasized the capitalist trappings of the Maker Movement, especially in its wasteful emphasis on production:

> "To me, a makerspace is entrepreneurially focused, techno-fetishistic bullshit. [...] Making is all about generating new stuff. Not about working with existing stuff. And not about altering or...for lack of a better word, hacking or maintaining or repairing or reusing. It's not about any of those things. It's about generating new ideas that might be businesses."

During a site visit, Viega witnessed the day-to-day operations at the MAL—including an after-school program where high school students volunteer at the MAL and work on passion projects, thus contributing to the MAL's dedication to community-building. One student sat on the floor of the space, repairing an IBM Selectric III that did not function after decades of disuse, tinkering with the mechanics and borrowing parts from another machine in storage. This project derived from an interest in machinery and repair and facilitated hands-on experiential learning. IBM Selectrics are notoriously difficult to repair and maintain—but rather than waste the approximate 3,000 mechanical and electric components of this machine, the MAL prevents technological waste in favor of both maintenance and learning. As striegl said: "Anytime I can encourage scavenging and retrofitting and maintaining and that practice of recycling the stuff that exists already, I'm going to, because it's, I think, dramatically better than the alternative—which is that these things end up in landfills and they're leaching heavy metals into the water." In this context, the term 'lab' becomes more useful for the MAL than 'makerspace,' since the term 'lab' "implies that there is experimentation and research happening"—not just the thoughtless production of objects. In other words, the MAL intentionally implements an epistemological framework into their day-to-day operations, ensuring that the research both scholars and community members conduct not only reduces harm to the environment, but also positively impacts the local and international communities in which the MAL participates.

While some spaces SHMLM studied resist the entrepreneurial connotations of the maker movement and worry they might detract from the mission of humanities-oriented making, others consider the value of entrepreneurship in undergraduate education. Stephen Frech, in his book chapter, "Blue Satellite Press," and in his interview, delineates the ways in which the apprenticeship model of his letterpress studio at Millikin University prepares his students for the workforce after they graduate—especially his students who study English and Creative Writing. He describes, for example, how humanities students develop "design skills by working in three-dimensional printing" and "production skills by doing letterpress printing," which might translate to jobs in writing, editing, publishing, and industrial-scale printing. As Frech writes, "the primary goals for the Blue Satellite Press course are to give students (1) the courage to launch their own publishing enterprise, and (2) practice imagining ways to engage a writing community and a readership. Too many English literature and writing majors feel the dread of graduation: What now?" As a student-run entrepreneurial venture, Blue Satellite Press prepares students in self-management, financing, and promotion.[9] While humanities disciplines often focus on cultivating what are called 'soft-skills,' humanities-oriented makerspaces seek to train students in 'hard skills' that translate into an ever-competitive job market.

[9] Stephen Frech, "Blue Satellite Press" in *Entrepreneurship in Action: The Power of Student-Run Ventures*, (Edward Elgar Publishing, Inc., 2021), 99-101.

Reading across SHMLM's study, we identify a seemingly paradoxical need to critique the Maker Movement while simultaneously putting it to good use. By assuming the title of 'makerspace' or 'makerlab,' humanities initiatives in higher-education institutions might exploit institutional resources to support subversive and often anti-institutional work. Yet the affordances of the term go beyond securing funding: the 'makerspace' or 'makerlab' label permits tinkering, collaboration, and community-building inside and outside of individual institutions. In her research, Lori Emerson, director of the MAL at CU Boulder, describes how the arts and humanities lab, although a relatively incipient construction, "still has tremendous, untapped potential to capture a remarkable array of methodically delineated and self-consciously documented entities for experimentation and collaboration that may or may not include an attention to history – though they almost always include an emphasis on 'doing' or hands-on work of some kind."[10] The influx of making-oriented initiatives seems to signal a need to learn, teach, and research within the humanities that differ from the institutional norms. The conscious incorporation of the lab-model—and perhaps other scientific terminologies and methodologies—can push humanities pedagogy and research in new and productive directions.

4.2: Pedagogical Values: Constructivism and Embodied Learning

The vast majority of our interviewees cited pedagogy as the primary goal for and activity of their makerspaces, signaling the centrality of teaching in this study. Kirschenbaum describes a straightforward, practical motivation as a teacher for creating BookLab, "I was frankly looking for something to do with students besides sit in a circle with them and talk about books. And so I wanted to kind of change up my pedagogy a little bit." Here the makerspace serves as a needed spur for the teacher, a means of resisting stagnation.

Ammon Shepherd described how the Tinkertank at the University of Virginia licenses students to direct aspects of their own learning and then become the experts, and teachers, of what they learn: "I tell them to go figure out something that's really cool and find it interesting that you haven't done yet...they're out there researching, learning how to do new things, and then turning around and teaching that, which you know is obviously beneficial for them, because that reinforces that learning that they've done." Similarly, Frech insisted that his classes in the press allow students to "learn...things that would allow them to take ownership over their own professional life." As students take multiple courses and work in his space, they assume greater responsibility, and indeed assume responsibility for the learning of newer students: "students develop greater and greater levels of independence. And so

[10] Lori Emerson, "The Media Archaeology Lab as Platform for Undoing and Reimagining Media History" in *Hands on Media History*, (Routledge, 2019), 175-186.

those students who have been in the course for two or three or four iterations are simply able to do more, and a lot of times I can, in fact, give them a team of less experienced students where they're working on their own project." In these accounts, makerspaces foster a more complex organizational structure—more like working life than the classroom, perhaps—with multiple lines of expertise, reporting, and responsibility.

Kirschenbaum connects the hands-on nature of BookLab to the function of the initiative as a social space, bolstering the pedagogical goals of the classroom: "given its hands-on nature, it's also inherently a kind of social and collaborative space, whether it's folks who are working on a project, but you know, having other people around to talk to as they're doing their own thing." Jean Lave and Etienner Wenger utilize the apprenticeship model to explore "learning by doing" in their conceptualization of situated learning.[11] In his interview, Frech identified how he intentionally implemented an apprenticeship model into Blue Satellite Press, which promotes teamwork and collaboration; students with more letterpress training can support less experienced students on their projects—eventually, students can operate with higher levels of independence and productivity, especially if they take his letterpress course multiple times. Lave and Wenger's "community of practice" also becomes a useful framework through which to think about the social nature of hands-on pedagogy: an individual's learning objectives are inflected by sociocultural practice, which necessitates the development of knowledgeable skills. Leuner describes this idea of a community of practice in the letterpress studio she directs: "something that we can all take away from letterpress is collaboration and helping one another, and sort of like social scholarship and social teaching and social learning, so that we're all there to help one another." In this context, hands-on and material pedagogy situated in the makerspace or makerlab inspires collaboration, teamwork, and community in a way that traditional humanities learning in classrooms might not. In humanities makerspaces, learning historical technologies can be a side door into learning practical 'soft skills' that transfer to a range of twenty-first century jobs, such as design thinking, project management, and community coordination.

In their interviews, both Senchyne and Fumerton elucidated how the hands-on pedagogy in humanities-oriented letterpress studios leads to students' facilitates students' critical thinking skills. While Fumerton notes how manual labor in letterpress work is "a great teaching tool for modern reading and writing" because it "changes how they read" and "how they recognize the way lines are set on a page," she also notes that these spaces do not strive to replicate history exactly. Letterpress "teaches [students] about the period, even though, of course, we're not recreating the actual environment of the period" because there is no slave labor, child labor, or exploitative apprenticeship models. Senchyne

[11] Jean Lave and Etienner Wenger, *Situated Learning: Legitimate Peripheral Participation* (Cambridge University Press, 1991).

notes how students often connect personal histories and experiences to their work in letterpress: "there's often a ton of people who have an uncle or their dad or themselves one summer who worked in the paper mills, and there's a way usually into labor history from that. [...] That way into that conversation usually helps us bring in a different set of knowledges here and the ability to tell some stories." Senchyne, like Fumerton, highlights how these conversations supplement units in his courses where he teaches about the role of slavery in printing. Even within classrooms, then, these processes of creation are necessarily tied to research, as they seek to inculcate historical insight through praxis.

Humanities MakerLabs make humanistic pedagogy and research *material* and *embodied*—ideas that reflect Seymour Papert's learning theory of constructionism.[12] While most of our themes appeared across a few interviews, every single participant mentioned the hands-on nature of their initiative as a primary motivation and virtue. As David Staley notes, "one approach to making in the humanities is creating physical objects as an interpretive act" or, even more broadly, "thinking with objects."[13] Humanities making implicates all the senses in ways that traditional classroom-learning techniques might not. In her interview, Leah Price discussed how remote teaching during the COVID-19 pandemic created "a real hunger among students for something tactile and sensory—sensory, not just involving vision and hearing." While in some disciplines such multi-sensory engagement might be better established, through labs in the sciences or studios in the arts, our participants' previous experiences in humanities classrooms indicated fewer opportunities for engagement beyond reading, writing, and discussion.

The goal for engaging other senses in humanities makerspaces is not to reject reading, writing, and discussion, but to complement them, or even to productively unsettle practices that have become habitual. Leuner described this phenomenon: "it removes us from our flight patterns of taking our ways of thinking and writing and doing analysis for granted, and the materials that have always been used for reading, writing, and doing analysis. And it adds an element of materiality and hands-on processes to the mix that I think don't exist in other areas, except maybe, like digital humanities making." For Kirschenbaum, the mission of UMD's BookLab connects to

> the desire...to work with things that are tangible, to work with the hands—I think something that we're a little bit sort of starved for in the digital world, perhaps. I'm fond of telling students that you think with your fingers...just as there's thinking that happens when you're out for a long, lonely walk in the woods, there's also thinking that happens when your hands

[12] Seymour Papert. *Mindstorms: Children, Computers, And Powerful Ideas* (Basic Books, 1980).
[13] Staley.

> are busy and doing something. And so we're a space to kind of facilitate and support that kind of thinking.

Leuner argued that the limitations of material engagement prove valuable for students' thinking as "they'll come up with something because they have to, because you're limited to...the typefaces that we have, the sizes that we have, what other people aren't using." In the digital age, where excess of choice is the norm, Leuner notes the restrictions as virtues, noting, "they're used to not being limited in terms of writing and thinking about composition." Several participants pointed to these boundaries as conducive to critical thinking and creativity, as students have to work with not only the materials available, but the constraints of the technologies that use those materials. Patricia Fumerton cited the physical work of her press, and the constraints of both material and time, as means to surface even inadvertent subject-area insight:

> [Y]ou do recreate some of the circumstances of an actual early modern lab in that era. You're rushing because of time. You've got an hour and fifteen minutes...and that's the way it was in the early modern period. They were rushing to get stuff out as fast as they could, because time was money. And so they learn that, and they learn what they learn is all the compromises that were made in the past, like one page goes through and it's a little smudgy, and you wanna get onto the next set of pages and you don't have enough time. And you're exhausted, so you let those smudgy pages go through, and they learn...

In this instance, working directly with historical technologies helps students better understand not just the objects they might encounter in an archive or museum, but the lived experiences of the laborers—often unnamed or uncited in the materials themselves—who produced them. Similarly, Price tied material engagement to greater historical understanding, noting that it facilitates better understanding, for both students and scholars, of how "these objects that we use daily as scholarly tools actually come into being, and therefore to think about their structure and about different forms that they take, and about the division of labor among these different forms and formats historically and in the present." Senchyne, too, described the ways in which the Text Technologies Press encourages students to think about their experiences as workers, as well as their relatives' experiences as workers. The hands-on nature of press work prompts "conversations around labor bring these stories and experiences in that, I think, widen the base of knowledges that we show that are important here and that are valued in the space." In other words, humanities making serves as a unique entryway into discussions of labor history and theory—and, as Senchyne pointed out in his interview, the exploitation of marginalized people in printing (i.e., enslaved people and children) and the history of various political movements (i.e., abolition, feminism). This final idea echoes a key value for Cordell

(writing here), that working with material such as moveable type and ink cultivates not just a mechanical understanding of how a historical book was constructed, but of the labor and expertise required from the historical people who undertook the work of its construction.

The pedagogical value of these spaces extends beyond enrolled students to include staff and visitor development. When asked what success would look like for their lab, many directors and managers mentioned visitor and staff development. They find success when visitors come into their space, learn how to use certain tools and methods, and develop skills for long-term personal and professional development. Adam Rogers that "engaging with the [NC State Makerspace] helps people in their career, or helps them to move into a new area of research, or get the next opportunity in graduate school or in a job. Those are certainly high points for me, of just seeing these particular individuals who've been supported." The TinkerTank at the Scholars' Lab of the University of Virginia similarly emphasizes this perspective in their mission statement, which states: "All humans are dreamers, creators, and achievers and our mission is to provide this place, the tools, and the support to empower people to dream, create, and achieve." This mission reveals an investment in people over processes: for humanities makerspaces, success lies not in a final product, but rather in the development of people. It is the *process* of making edifies people—not the product itself.

It follows, then, that multiple participants attributed their success to the undergraduate and graduate student workers who manage these makerspaces and contribute to their intellectual environments. Student workers enrich makerspaces by facilitating unique research—yet, as several participants noted in their interviews, they especially see success when student workers carry their experience into the world. Frech identified students' personal and professional development as a driving force for the initiative: success lies in their ability to acquire letterpress experience that they might extrapolate onto future careers, skills, and hobbies after they graduate. Stephen discussed how students "become messengers. [...] They become people who are able to explain to other people what they're looking at." Working in humanities makerspaces cultivates skills in pedagogy, public engagement, and engaged scholarship that can be invaluable in students' future careers, even if their work does not directly incorporate the technical elements of the makerspace where they trained.

4.3: Humanities MakerLabs as Third Spaces

Humanities MakerLabs provide alternative and often subversive learning models within higher education institutions. While these spaces engage in academic research and learning, they also foster social spaces in which people can interact, collaborate, relax, and find joy. Kirschenabaum describes this phenomenon in BookLab at UMD's English department, deeming it a "third space":

> It's not a classroom, it's not somebody's office. It's a different kind of space. It's social. It's collaborative. As I'll point out, it even—not only does it look differently from other rooms in the building—it smells a little bit differently from other rooms in the building. [...] So there are lots of things, I think, that kind of signal its difference in productive ways. And given, again, its hands-on nature, it's also inherently a kind of social and collaborative space.

Humanities MakerLabs—as opposed to traditional classrooms or labs—prioritize the affective experience of visitors. Although hands-on pedagogy remains a central tenet of these spaces, participants overwhelmingly mentioned how happiness drives their initiatives. Students often come to these makerspaces as a reprieve from their stressful academic careers: they make things to destress; they bring in friends and socialize with them; they seek refuge in the comforts of the physical space, which they might not find elsewhere. In the same way that Kirschenbaum describes BookLab as a "happy space," Dombrowski similarly categorizes the Textiles Makerspace as a 'happy place' that is different than other spaces on campus:

> People just like to poke their heads in this room and are like, "Wow! This. This seems like a really nice place!" I'm like, yes, please come in here. What can I show you? Here, let's make a scarf, and they come in, and they make it, and they're in, and they're happy. You know. It's just like the energy in there sometimes is, you know, just really good. And there are so few spaces on this weird giant and often empty campus that feel like that.

These humanities initiatives subvert institutional expectations: the value of the lab lies not in scholarly outputs or deliverables, but rather happiness for happiness' sake. The neoliberal institution, with its capitalist investments, forsakes the well-being of its workers for profits—these labs push back on this infrastructure to promote other ways of learning and living. Indeed, the idea of BookLab as a 'third space' correlates with Price's estimation of Scarlet Letterpress, with its "utopian potential of a sort of project-based learning." Price discussed how she and her graduate students bring different skill-sets to the initiative, thus allowing them to learn from one another. Participants, of course, discussed how students become experts by engaging with humanities making—but they also noted how experts become students, too. Leuner mentioned that "the letterpresses as makerspace-oriented toward my area of scholarship is often a nice dose of humble pie. And it does put me in this mode of just like, okay, I'm a grasshopper. I'm learning a new thing. It's probably gonna go wrong every time I try to do it, except when I get lucky." In this context, humanities makerspaces flatten the hierarchical structures present in an ordinary classroom: everyone learns and grows together, regardless of institutional rank. Humanities makerspaces act as sites of resistance to hegemonic modes of learning within higher

education. This model of learning provides a model for living—a utopian hope.

These initiatives also become 'third spaces' within the broader makerspace communities on their campuses. Multiple participants commented on how humanities makerspaces offer alternate approaches from both art-oriented and STEM-oriented makerspaces, thus opening up new avenues of making. Several humanities-oriented letterpress studios particularly highlighted how their work differs from their art-department equivalents. Fine arts studios create professional final products, whereas humanities studios demonstrate an investment in experiential learning processes. As Senchyne stated: "when my Book History students are coming in to do letterpress, they're not there to think about their own practice and to develop their craft as artists. They're there to learn something about the creation of the material text." Similarly, Price noted how Scarlet Letterpress operates differently than STEM-oriented labs, which are often "under a lot of pressure to produce a deliverable for a grant." Unlike STEM-oriented labs, humanities makerspaces do not quantify success in terms of institutional deliverables—and, unlike art-oriented studios, humanities makerspaces prioritize process over product. These humanities initiatives, then, become a 'third space' where visitors can learn and research without institutional pressure to present a perfect final product.

Certainly, Cordell's and Viega's experiences operating Skeuomorph Press & BookLab similarly reveal the need for a third space in the higher-education institution—particularly the need for a *queer* third space. In the same way that BookLab offers students a social space, queer students spend time in Skeuomorph working on printing projects, finishing homework, and chatting about non-academic topics. Within this vibrant community—felicitously hosted in the physical space of a historical letterpress shop—queer people exchange ideas and create exciting new projects. For example, Skeuomorph employee Keely Kuester, with the assistance of Skeumorph Assistant Director Kadin Henningsen, envisioned and executed a print project that used coding to track Walt Whitman's composition of "A Font of Type." These students visualized how the physical movements of historical queer printing can be replicated and mapped in contemporaneity by other queer printers. More generally, however, the employees of Skeuomorph utilize the historical fabrication technologies to fill critical lacunae in queer history; they explore the ways in which certain technologies and practices have been gendered, queered, subverted, and reclaimed over time. Viega, for example, has taught the gendered and queer history of the typewriter, encouraging their students to use any of the manual, electric, and electronic typewriters in Skeuomorph for their creative projects inside *and* outside of class.

Yet these humanities initiatives serve a wider range of students marginalized by the hegemonic university structure. In recent years, articles and studies record the declining mental and physical

wellbeing of undergraduate and graduate students as they pursue their degrees; the mental health crisis, in particular, has spurred universities to supply certain resources and accommodations, such as therapy animals or self-care workshops during finals week.[14] Our research revealed that humanities-oriented maker initiatives can help support students struggling to maintain their wellbeing. Several participants explicitly discussed the benefits of their spaces on mental health: Shepherd described a class that utilized the TinkerTank as a "regenerative class period," wherein students might spend this allotted time working with their hands to cope with an otherwise stressful semester. Dombrowski's work with textiles and data visualization similarly emphasizes the importance of self-care and community care, exemplified in the makerspace's 'guestbook.' Dombrowski encourages visitors to weave their emotions into this guestbook through color-coded threads and beads; the guestbook allows people to "reflect how they're feeling that day, which is often really cathartic." Eventually, this guestbook becomes a tapestry which will be displayed on the walls of the space, memorializing individuals' day-to-day experiences while simultaneously demonstrating how these experiences tessellate with one another in a community. As Dombrowski emphasized in her interview, university administrations recognize how "mental health is a real problem," and how students need "creative outlets." These third spaces facilitate collaborative research, build community, and support marginalized individuals—benefits which might be leveraged for further resources from the university.

When the researchers asked participants why they partake in this work, several reported that they found and sustain these initiatives because they simply enjoy the physical act of creation—indeed, their students and community visitors similarly enjoy crafting without an institutional deliverable. The Textiles Makerspace, for example, can be traced originally to Dombrowski's desire to sew in her office during lunch. While she notably facilitates groundbreaking research in data visualization and other digital humanities projects through textile fabrication, Dombrowski emphasizes how the people use the space "for whatever it tends to make them happy. And...happiness is often in short supply, it feels like on campus, and with the undergrads in particular, and the grad students." Likewise the projects we support at Skeuomorph do not *always* meet explicit deliverables in research or classroom projects. Through tinkering and experimentation, we know some of our community will be inspired toward projects that do fit such goals, but we are equally happy with tinkering, exploration, and the attendant feelings of accomplishment are the end product for many of our community members.

Frech discusses how Blue Satellite Press quickly changed their focus to printing poetry broadsides to "letterpress ephemera," like their Cheeky Greeting Cards line, because they were "silly and fun." Of

[14] Zara Abrams, "Student mental health is in crisis. Campuses are rethinking their approach" in *Monitor of Psychology*, Vol. 53 No. 7 (American Psychological Association, 2022).

course, Frech and his students utilized a high level of craft to print such ephemera, but the *value* of this making manifested in the *practice* of making. This phraseology, while common parlance in the twenty-first century, derives from the Aestheticism movement in the late nineteenth century, when art critics and philosophers advocated '*l'art pour l'art*,' or 'art for art's sake.' The discursive power of language remains one of the primary modes through which we might fight for humanities and arts education in higher education institutions (consider Edgar Allen Poe's 'this poem written solely for the poem's sake,' etc.). Different iterations of this idiom persist, for good reason: the historical context here reminds us how humanities disciplines possess intrinsic philosophical value. The humanities are good in their own right, regardless of any consequentialism.[15]

Often in the twenty-first-century academic, we are asked to measure success by quantitative metrics, from student satisfaction scores to grant dollars. However, throughout this study we were struck by how many responses about success in humanities makerspaces focused on *affect*: most specifically happiness, personal achievement, and joy. In other words, for many of our respondents, visitor and staff happiness are centered as key measures of success. Dombrowski, for example, remarked how "where I'm at currently feels like success. People come in and they make things. And they're happy." The driving force of these initiatives is a need to cultivate joy within the academic community. Learning does not need to produce deliverables for the institution; rather, *joy* becomes a valuable outcome of learning. Several participants who direct letterpress studios specifically noted the affective experience that accompanies hands-on humanistic learning: Senchyne said, "the best feeling in the world is watching somebody's face when they pull an impression for the first time and see it happen." Similarly, Leuner remarked how "someone who's never printed before, right, they turn the wheel, and the platen reveals the thing, and they take off their print and their face lights up right there. It's just joy." Despite the challenges inherent in maintaining humanities makerspace initiatives, creating a sense of joy outweighs any ensuing negatives.

Taking these responses—and our own experiences of joyful moments in Skeuomorph Press—seriously, we insist these are not incidental or negligible outcomes, but key insights into the value of humanities makerspaces in a moment of increasing instrumentalization and scarcity in higher education. Helen Small notes, "The core assertion here is not the (overpitched) one that 'the humanities will make you happy'; rather, that the humanities can help us to understand better what happiness is, how we may better put ourselves in the way of it, and how education may improve the kind and quality of some of our pleasures."[16] Giving faculty, staff, and students spaces to explore and create without immediate economic or career pressures draws on well-established (but often ignored) knowledge about the value

[15] Helen Small, *The Value of the Humanities*, Oxford University of Press, 2013), 6.
[16] Small, 5.

of holistic education, and contributes to mental health, a common theme in higher education discourse since at least 2020, though one often addressed through platitudes rather than concrete investments. Nearly all of our respondents cited some idea of happiness and joy when asked to articulate the value of their spaces, and we believe the value of joy is both salient and essential to this community moving forward.

4.4: Challenges

Participants discussed myriad challenges they have experienced while founding, maintaining, and operating humanities makerspaces at their respective institutions. These challenges speak to the overall value of the humanities in higher education institutions across the United States—especially how academic infrastructure often creates barriers to scholars pursuing humanistic learning and research, in contrast to scholars who work in STEM. As such, this section considers the institutional effects when humanities disciplines turn to hands-on making.

4.4.1 Space

One of the first challenges that humanities makerspaces encounter is acquiring a physical space to house their initiative. Some makerspaces converted empty offices or departmental rooms after complicated approval processes, while others joined spaces already occupied by organizations or initiatives. Even if these humanities makerspaces manage to locate a space in the start-up process, they still face countless challenges: some lack requisite resources to undertake their work (i.e. sinks for cleanup), while others encounter safety hazards (i.e. lack of ventilation, exposed wiring). Humanities makerspaces, after their initial launches, often expand due to increased interest and foot-traffic; their smaller spaces cannot accommodate larger classes or general demand during open hours. Even after departments allocate the initial space, these initiatives often need to acquire even more space. Space, as such, is a continuous challenge.

4.4.2 Funding

Nearly every participant identified funding as the major challenge to their humanities initiative. Several participants discussed how the initial start-up funds not only supplied these makerspaces with the requisite resources, but also remain the primary source of funding—many initiatives do not know what will happen when the funding runs out, nor where to secure more money to stay afloat. As one director noted, “It's easier to get funding to start things than to maintain things. And the thing that

keeps me awake at night is worrying about what's going to happen to both this project and to its physical manifestation after this round of funding is out."

4.4.3 Staffing

Several participants noted that their initiative would benefit from more staffing. Many directors manage courses and programming without much support, as they do not have the funding to hire more staff members nor the time to train them. Some humanities makerspaces have undergraduate and/or graduate students who operate open hours, including BookLab at UMD. Yet Kirschenbaum still identifies staffing as a primary challenge: "We have, you know, all the work we can handle. We more or less have the resources we need. You know, that beside space, the other key resource, it's not type or another press—it's more people. And so just expanding the staff a little. Those are the things that I think about."

Leuner articulated the importance of trained staff: "I would love it if there were more people who were trained, because then we could sort of spread the love, right? Like more people could offer classes, or offer demos, or you know, I could hopefully collaborate with someone on a printing project without having to choose from two people who are already really busy, awesome people. So more trained printers would be another vision for success." Limited staffing therefore limits the possibility for these initiatives to expand and have a broader reach across disciplines and communities.

4.4.4 Lifecycles/Survival

Humanities makerspaces are often concerned with the lifecycle of their work, as well as their technologies more generally. Humanities-oriented letterpress studios, for example, often receive their equipment from defunct print shops, or open when other spaces shut down: the Digital Humanities Initiative at Santa Clara received their machines from a local printer, while Text Technologies Press filled the gap that UW Madison's Silver Buckle Press left when it closed after fifty years of operation. Indeed, many directors worried what might happen to these spaces after they retire: one participant noted that "If somebody says, 'What are we going to do with that [equipment] if you leave?' that means, 'If you leave, we're not rehiring in this area, and we don't expect anyone to keep teaching this stuff.'"

While many participants expressed an anxiety about their spaces' longevity in the long-term, there was also a pervasive sense of hope despite these hardships. As Frech stated, "I feel an obligation to the equipment and the endurance of that equipment. And in this way I feel that I am a steward of it, more

so than an owner of it. It's mine, I own it, but if I take care of it, if I treat it right, it should outlast me, right? I will be long gone, and these presses will still be working. [...] And this understanding helps me understand that I'm also a steward of the discipline." All participants articulated a need for these initiatives—so they fight for their survival despite all odds.

4.4.5 Bureaucracy

All of these challenges—space, funding, staffing, survival—all stem from the bureaucratic infrastructures that make up US higher education institutions. Participants, while expressing gratitude to participate in this work, sometimes mentioned administrative bureaucracy that hindered their ability to teach and research in these makerspaces successfully. Directors must tirelessly advocate for resources to maintain their initiatives, and they often face backlash for doing so.

4.5: Advocacy

In the initial round of interviews, the SHMLM investigators asked participants about the value of their makerspaces to humanities disciplines, both within their immediate academic community and within the humanities more broadly. Responses varied: some participants located the value of critical making in new pedagogical methods, while others emphasized the joys of learning and community-building. Yet several participants acknowledged that many do not see value in this mode of pedagogy and research. Senchyne, for example, discussed how the value of the Text Technologies Press often centers on "the people who rely on it for their teaching" and the students who describe the printing module as "the coolest thing [they've] done and the best part of the course." Despite the positive role of the press in undergraduate and graduate courses across a variety of disciplines, Senchyne admitted: "Outside of that, I don't know that people see a lot of value in it. [...] I don't think that it's a situation in which everyone else just fails to see how brilliant it is. I think it's a situation in which the honeypots for growth are in computer and data science." Although he continually finds the opportunity to expand the Text Technologies Press, "the discussion is always, you know, that's a huge space cost, what are we going to do if you leave?" As discussed in Section 5 of this paper, nearly every humanities-oriented making initiative we interviewed finds consistent pushback from university administrations; directors and managers tirelessly advocate for the importance of their space—for both instructors, students, and the persistence of the humanities discipline.

In his interview, Frech similarly discussed the difficulty of maintaining and expanding a letterpress printing: "There's the concern about equipment. How do you get it? Where do you get it? Who maintains it? [...] Where are you gonna put it? Who has access to the space?" These logistical questions,

while difficult to address on a bureaucratic level, often supersede the disciplinary value of these initiatives. Directors, managers, instructors, and students can easily identify the significance of makerspaces and makerlabs in their scholarly activities, but administrators consider value in different terms. Frech observed how administrators' metrics of value are: "does it bring students in? Does it enroll? And does it get students to persist and reach some of the goals of graduation, right? Those are all important questions that we have to ask, and I think quite frankly, professors should be asking as well." Although humanities-making initiatives struggle to survive amidst administrative bureaucracy, this type of hands-on research and pedagogy helps instructors and students advocate for the discipline as enrollment and funding increase in STEM fields. By appealing to university administrations, makerspaces and makerlabs might secure a foothold in the ever-changing higher-education structure. For example, Kirschenbaum remarked how BookLab "externalizes" the work that the English department does, especially in terms of marketing: "it's not very photogenic to watch people read books, sit in a circle and talk about them, write about them, which constitutes sort of the bulk of what English departments do, reading and writing. [...] There's always something happening here that [the Marketing and Communications team] can photograph and document and build a story around." These humanities making initiatives serve as salient sites for undergraduate tours, scholars' visits, and marketing that demonstrates the university's academic excellence—in action. This discourse reflects a core finding from the interviews conducted in SHMLM: the efficacy of making initiatives typically correlates with universities' assessment of their economic value. Do humanities makerlabs stimulate financial profit, and can the learning conducted in these spaces be quantified?

The survival of humanities research and funding arguably necessitates a strategic emphasis on interdisciplinarity, since the term 'interdisciplinarity' in higher education is often invoked "to assist funding bodies in meeting the government-imposed requirements that public money should promote 'knowledge transfer', 'economic relevance', and 'impact' or social benefit."[17] Yet the value of interdisciplinary extends beyond funding logistics—interdisciplinary frameworks promote learning and research. Certainly, scholars of makerspaces and critical making in higher education have established the ways in which hands-on learning promotes interdisciplinarity. John Hunter, for example, advocates for the need "to see a makerspace not only in physical terms but also as an intersection of disciplines: an interdisciplinary matrix that provides a (non-)place for critical creativity and combines elements of the arts, humanities, social sciences, and STEM fields."[18] The majority of interview participants acknowledged that humanities students and researchers predominantly utilize

[17] Small, 16.
[18] John Hunter et al., "Reifying the Maker as Humanist" in *Making Things and Drawing Boundaries: Experiments in the Digital Humanities* (University of Minnesota Press, 2018).

the space more than other disciplines, signaling a need for experiential learning spaces that exist outside of institutional norms.

The interdisciplinary nature of these humanities initiatives manifests in their various departmental homes: many are housed across English, Information Science, Language, and Art departments, while others are housed in libraries. Participants noted that their spaces have fewer barriers to entry, unlike STEM- and Art-equivalents: Ammon, for example, noted how UVA's TinkerTank fills a "gap for engineering students who don't have a space or home that they can go to." Rogers similarly discussed how the NC State Makerspace's location in the main library "gives us a unique ability to reach out and be available for a lot of people. Libraries are generally for everybody, so that kind of gives us a leg up on being accessible or inviting, at least, to lots of people." Most participants highlighted a pressing need for both non-humanities and humanities students to engage with humanities making. Fumerton, in particular, described how

> Students from the sciences take our courses because the sciences have been making way before we were. I mean all lab work is maker work. So it's not like it's a foreign concept to them to get your hands dirty, and to be holding a test tube. It's the same as holding a composing stick. [...] One of the reasons I think the word 'lab' has caught on is that it's a science-connected facility. It's a merging of the sciences and humanities.

Participants like Fumerton highlighted a pressing need for both non-humanities and humanities students to engage with humanities making. Dombrowski similarly remarked upon the ease in which STEM students participate in study and research at the Textile Makerspace, since, for them, "the legitimacy of making things is not even in question...[it is harder] to get people who have been told that your job is to read books and write text." Leuner and her colleagues from the Art and Art History department, too, intentionally founded the Digital Humanities Intiative's letterpress studio "as an interdisciplinary art-meets-English-and textual-studies endeavor," thus reflecting the public-facing and community-oriented environment at the Santa Clara University. These examples underscore the importance of interdisciplinary spaces that foster collaboration across disciplines, enrich students' educational experiences, and expand the impact of humanities research.

5. Future Directions

Besides the major themes presented above, the interviews revealed several areas that warrant further investigation.

5.1. Scholarly and Research Value

Although nearly all the Humanities MakerLabs we surveyed center pedagogy, these spaces also encourage innovative research that could not be accomplished without hands-on access to materials and resources. Certainly, pedagogy and research often go hand-in-hand, as experiential learning opens up new pathways for knowledge production. Abstract ideas materialize *in* and transform *through* physical objects; theory and practice inform one another. In some cases, ground-breaking research ideas and research projects might not exist without humanities-oriented labs. Élika Ortega Guzmán, for example, studies digital literature produced at the cusp of the twenty-first century. Without initiatives like the MAL at CU Boulder and the Electronic Literatures Lab (ELL) at Washington State University, she would not be able to 'read' some of the texts she studies, which predominantly exist on floppy disks and CD-roms. Even with access to the software and hardware in these labs, obsolescence and digital decay often impact the ability to read electronic literature; only some parts of the text might be recoverable. These technological challenges, however, inform the ways in which we might approach and close-read fragmentary texts. Élika's research presents new experimental methodologies to conduct literary analysis, thus disrupting the institutionalized epistemologies associated with the English discipline. Similarly, Leuner discussed how "letterpress printing opened an avenue of inquiry that I never would have come up with otherwise." Her research on ink was directly inspired by her hands-on work with its material reality. To read about the historical production of ink establishes a basic theoretical foundation, but to work with ink—or even to produce it oneself—might fill gaps in the theory and generate new insights that provide fresh interventions in established fields of criticism. If more scholars had access to these spaces, "if our world were able to expand a little bit," as Leuner said, humanities research might transform in positive and productive directions. Several participants expressed a desire to conduct more research and to facilitate more scholarship in their initiatives despite their focus on pedagogical activities. Lack of funding and full-time staff prevent these humanities-oriented labs from initiating and supporting research projects, as already-limited resources are primarily diverted to day-to-day operations and class visits.

5.2. Accessibility

During our first round of interviews, we asked participants how they address accessibility issues that arise in their spaces, especially if they feature historical equipment that was not designed with accessibility in mind. Participants interpreted accessibility in two ways: first, they thought about accessibility as *who* might enter the space and *how*; second, they thought about accessibility in terms of dis/ability. When particularly asked about disability accommodations, many participants described a case-by-case approach where they might cater accommodations to an individual's specific needs.

Several participants mentioned accommodations that they continuously offer. BookLab, for example, offers visitors the opportunity to use Braille kits or read books in Braille, while the Text Technologies Press supplies closed-captioning on their website's instructional videos. Both BookLab and the Text Technologies Press have also accommodated people with mobility assistance devices by placing table top presses on tables at reachable heights. Additionally, Rogers and Senchyne discussed how the pandemic altered the ways in which they approached at-home accommodations. Through the use of at-home kits and apps, users might partake in humanistic learning and making outside of the physical space. The MAL similarly offers visitors the opportunity to take home lab equipment if they cannot access the building's entrance, which sits at the bottom of a flight of stairs. Accessibility, however, remains a peripheral issue for many Humanities MakerLab initiatives: either the space does not regularly receive visitors with disabilities, or the managers of the space do not know how to incorporate accommodations into existing infrastructure. In extreme cases, some university administrations outright refuse to supply accommodations for visitors with disabilities despite continuous requests from the staff. Future iterations of this project might consider how to create more welcoming environments that encourage people with disabilities to access the resources offered by these MakerLabs. Automatic accommodations like closed captioning, Braille materials, at-home kits, and a lending system might invite a more diverse range of users into these initiatives.

5.3 Community Engagement

While Humanities MakerLabs sometimes implement public programming or event outreach, their primary audience is their immediate institutions. Multiple initiatives described how they want to expand their outreach into the local community, but they do not possess the resources to facilitate that work. Community engagement, however, seems to enhance the efficacy of Humanities MakerLabs. The MAL provides an operational model which factors community members into their infrastructure: volunteers manage community open hours and maintain machinery; high school interns learn about the lab's technology, contribute to ongoing projects, and conduct their own work; their practitioner-in-residence program also provides artists and scholars the opportunity to share their work with communities inside and outside of the university. While the MAL is just one example, their non-hierarchical and community-focused approach demonstrates how Humanities MakerLabs might have a larger impact, beyond the institution. Community engagement requires patience, work, and resources, however; striegl discussed how "more community engagement does mean you have to be more in the community. [...] You have to do the work part of it. It doesn't just happen." As we develop this project in different directions, we might theorize the importance of the community in the Humanities MakerLab while simultaneously developing an organizational approach that might encourage community engagement.

5.4. Digital Humanities

Quite a few of our survey participants also identify with the field of digital humanities (DH), where there has been a long standing discussion of creation and critique, a dichotomy that was articulated famously as "more hack, less yack." As Bethany Nowviskie notes in her history of this phrase, the phrase began as "a silly...comment on the dominant structure of academic conferences" and then "went viral at a moment when the last thing the digital humanities needed was an anti-intellectual-sounding slogan."[19] It was never intended as a mantra for the entire field and nevertheless was, from its inception, hotly contested within the field itself. While rejecting the strong interpretation of this dichotomy, Stephen Ramsay articulated the value of making as a complement to reading and discussion, noting

> as humanists, we are inclined to read maps (to pick one example) as texts, as instruments of cultural desire, as visualizations of imperial ideology, as records of the emergence of national identity, and so forth. This is all very good...But *making* a map (with a GIS system, say) is an entirely different experience. DH-ers insist—again and again—that this process of creation yields insights that are difficult to acquire otherwise.[20]

Scholarship in DH has consistently advocated for intellectual modalities that align with capacious ideas of making, and often contrasted those modes of engagement with more established humanistic practices: e.g. building websites, databases, and datasets; creating digital editions of texts; programming humanities applications; 3D modeling historical artifacts or spaces. Paul Fyfe famously argued that DH-inspired "hacking" can happen in the classroom without computers,[21] while Julie Thompson Klein connects multiple generations of digital humanities work by tracing "the practice of of making in arguments and activities that reconceptualized building tools from reductive mechanical work to an intellectual endeavor in its own right."[22] In a recent article, Dombrowski et al. similarly demonstrate the need to reconnect crafting to the digital, embodied by the #DHmakes initiative launched in the past few years.[23] Given this history, we find it notable that many in digital humanities have more

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[19] Bethany Nowviskie, "On the Origin of 'Hack' and 'Yack'" in *Debates in the Digital Humanities* (University of Minnesota Press, 2016).
[20] Stephen Ramsay, "On Making" in *Defining Digital Humanities* (UCL Press, 2013).
[21] Paul Fyfe, "Digital Pedagogy Unplugged" in *Digital Humanities Quarterly*, Vol. 5 No. 3 (2011).
[22] Julie Thompson Klein, "The Boundary Work of Making in Digital Humanities" in *Making Things and Drawing Boundaries* (University of Minnesota Press, 2017).
[23] Quinn Dombrowski et al., "#DHMakes: Baking Craft into DH Discourse" in *Korean Journal of Digital Humanities*, Inaugural Edition (2024).

recently turned to the explicitly materialist forms of making surveyed by SHMLM, and note that this turn merits further theorization.

5.5 Collaboration

This project has identified a vast network of Humanities MakerLabs across the United States, although the collaboration between initiatives remains limited in many cases. As the humanities discipline reevaluates its relationship to experiential learning, an increasing number of these initiatives have appeared over the last decade. These initiatives often work in isolation, building from the ground-up and developing organizational techniques, instructional materials, and pedagogical approaches from scratch. Humanities MakerLabs might benefit from sharing the advice and resources that we have accrued over the years, especially as incipient initiatives find their footing in ever-complicated institutional landscapes. A national network would help humanities-oriented labs advocate for their funding and overall survival, consequently facilitating a greater number of students, scholars, and community members to engage in cutting-edge learning and research.

During initial interviews, participants reported some connections with both local and national communities—yet, overall, the investigators noted the relative isolation of each individual humanities-oriented makerspace. This whitepaper seeks to initiate a nationwide, if not international, network of these types of initiatives regardless of identification with the Maker Movement or the fabrication lab movement. Participants such as Shepherd described the benefits of connecting with other labs across the country through conferences and other maker-oriented gatherings; this community incited Ammon and other makerspace directors to form a Virginia-based consortium. This example demonstrates both the desire and the necessity of community-buildings: through dialogue and collaboration, we can advocate for these initiatives so they might find the requisite resources to ensure longevity.

Following the publication of this whitepaper, our team will develop a questionnaire for wider distribution, which will allow us to acquire more comprehensive data as we prepare formal publications about our findings. We plan to facilitate the convening of a network of humanities makerspaces across the country to collaboratively advance this field.

Appendix I: Makerspace Descriptions

Textiles Makerspace at Stanford University

The Textiles Makerspace, housed in the Division of Literature, Cultures, and Languages at Stanford, facilitates learning and research related to textile arts. Their equipment includes sewing machines, embroidery machines, looms, fabric, and yarn. While the Textiles Makerspace explicitly participates in a tradition of Digital Humanities making, the lab also encourages hands-on making and learning in non-academic contexts. Stanford is a private university with approximately 17,000 students.

Text Technologies Press at University of Wisconsin-Madison

The Text Technologies Press at the University of Wisconsin-Madison is a letterpress studio, sponsored by SLIS Library and Center for the History of Print and Digital Culture. Their equipment includes a tabletop clamshell press, a BookBeetle, assorted type, and requisite printing supplies. The studio provides a hands-on "basic to intermediate letterpress experience" for book history courses that seek to think through the materiality of texts. Book history courses are offered through the Information School. The University of Wisconsin-Madison is a land-grant public university with approximately 50,000 students.

Digital Humanities Initiative at Santa Clara University

The Digital Humanities Initiative at Santa Clara University features a pedagogical letterpress studio, predominantly aimed at teaching students about book historical processes. The space, housed in an Art & Art History department building, features multiple printing presses, cases of type, and requisite printing supplies. The initiative shares their space with the art department's printmaking studio and aims to have their own space one day. DHI's letterpress studio encourages humanistic learning and inquiry through hands-on making. Santa Clara University is a private Jesuit university with approximately 9,000 students.

TinkerTank at the Scholars' Lab of the University of Virginia

The TinkerTank, as part of the Scholars' Lab at the University of Virginia, is a makerspace that encourages tinkering with fabrication tools, including sewing machines, button makers, 3D printers, Arduinos, Raspberry Pis, and soldering irons. Their mission states that "all humans are dreamers, creators, and achievers and our mission is to provide this place, the tools, and the support to empower

people to dream, create, and achieve." The TinkerTank is currently housed in UVA's Clemons Library while the main library is being renovated. The University of Virginia is a public university with approximately 24,000 students.

Blue Satellite Press at Millikin University

Blue Satellite Press is a "a student-run literary letterpress publishing company" (Frech 2021) in the English department at Millikin University, providing students with professional skills and entrepreneurial experience. The Press initially produced poetry broadsides by living American poets, but expanded their work to include other printing ephemera like greeting cards, bookmarks, and coasters. Millikin University is a private college with approximately 1,800 students.

The Makerspace at NC State University

NC State University's Makerspace, housed in the Hill Library, allows students to engage with making technologies and fabrication tools such as sewing machines, 3D printers, 3D scanners, electronics prototyping kits, and a laser cutter. The Makerspace aims to foster access to these modes of making while developing "maker literacy." NC State University is a public land-grant university with approximately 38,000 students.

BookLab at University of Maryland

BookLab is "the English department's makerspace, letterpress printing studio, library, and Center for the Book Arts" at the University of Maryland. Their equipment includes a BookBeetle, multiple printing presses, cases of metal and wood type, a 3D printer, a Cricut, a GlowForge; they also have materials for zinemaking, bookbinding, and papermaking, as well as collection materials. BookLab facilitates pedagogical activities for students who seek "hands-on experiential knowledge." The University of Maryland is a public land-grant university with approximately 41,000 students.

Initiative for the Book at Rutgers University

The Scarlet Letterpress is the Book Initiative's makerspace at Rutgers, featuring a Showcard press, BookBeetle, Provisional Press, type, typewriters, bookbinding tools, papermaking materials, and bibliographical collections. Scarlet Letterpress is "designed to introduce undergraduates and graduate students both to media history and to book-making." Rutgers University is a public land-grant university with approximately 69,000 students.

Maker Lab at University of California Santa Barbara

The Maker Lab at the University of California Santa Barbara was founded as a "teaching instrument," offering students the opportunity to learn both the history of print and modern modes of textual production. As part of the English department's Early Modern Center, the Maker Lab bridges historical equipment with contemporary technology, working with a Gutenberg-style pull press, 3D reproduction, and digital tools. The University of California Santa Barbara is a public land-grant university with approximately 26,000 students.

Appendix II: Thematic Analysis

Theme 1: Mission and Scope

1.1. Humanities makerspaces offer access to tools and methods that facilitate experiential learning, critical making, and personal and professional development in the humanities discipline.

1.2. *Adam*: "Yeah, I think it was part filling a gap. Because it was definitely, you know, we saw that there were these tools and this kind of area of technology that was, you know, like generally useful to lots of types of—lots of disciplines on campus. But that wasn't generally accessible across the disciplines."

Jonathan: "So, the mission of the Text Technologies Press is to provide a basic to intermediate letterpress printing experience and any number of classes that might be interested in it."

Matthew: "We, as the name suggests, are a makerspace devoted to the Book Arts, especially to letterpress printing, which is a unique capability on this campus. There's no other place on campus that does it."

Patricia: "But my goal was simply to get a press and to be able to show students how it worked and what printing looks like."

1.3. Each makerspace had its own mission statement, but the main themes from coding include access, experiential learning, making, and personal & professional development. Each space fills a gap on campus, so to speak—many directors founded their initiatives as a teaching tool that did not exist before; some spaces (like the NC State Makerspace) were created to serve a variety of students (especially those who faced barriers in their departmental equivalents).

Theme 2: Research and Pedagogy

2.1. Humanities makerspaces are overwhelmingly pedagogical. While they support research endeavors, their main focus is experiential learning.

2.2. *Leah*: " It is definitely—it is overwhelmingly pedagogical."

Kirstyn: "I would say the mission of our maker space is 90% pedagogical. It's all about teaching. Santa Clara is a teaching college, and our heart and soul is in the humanities."

Matthew: "I would say it's primarily pedagogical."

Jonathan: "So, yeah. I think largely, like, the value of it depends on the people who rely on it for their teaching."

Patricia: "So it's a very great teaching tool from modern reading and writing, but it also teaches them about the period, even though, of course, we're not recreating the exact—the actual environment of the period. Cause there's no slave labor involved or needing apprentices. But it began as a teaching idea, and it remains primarily a teaching idea."

2.3. The pedagogical value of these makerspaces lies in their new modes of humanistic inquiry through hands-on approaches. Interviewees also discuss how these initiatives decentralize knowledge: students become experts, and experts become students. This proposition statement does not reflect the few makerspaces we interviewed who facilitate research more than teaching (Adam, Ammon).

Theme 3: Humanities Value

3.1. Humanities makerspaces make humanistic pedagogy and research *material* and *embodied*.

3.2. *Leah*: "And say, the more short term answer is that Rutgers had an unusually long period of remote teaching. We were remote for, depending on how you count, over a year. And so I think at the end of that time, there was a real hunger among students for something tactile and sensory—sensory, not just involving vision and hearing."

Kirstyn: "It's very different from DH. But it does some— it has a similar effect, at least for me, in that it removes us from our flight patterns of taking our ways of thinking and writing and doing analysis for granted, and the materials that have always been used for reading, writing, and doing analysis. And it adds an element of materiality and hands-on processes to the mix that I think don't exist in other areas, except maybe, like digital humanities making."

Matthew: "And given, again, its hands-on nature, it's also inherently a kind of social and collaborative space, whether it's folks who are working on a project, but you know, like having other people around to talk to as they're doing their own thing."

3.3. Participants constantly talked about the material, hands-on, tactile experiences that their spaces engender. This statement also connects to the affective value that several participants discuss, considering that things like joy are also embodied experiences. This connects to Endres' and Hunters' discussions (in the annotated bibliography) about scholarly thought and academic work being perceived as disembodied practices.

Theme 4: Campus Value

4.1. Humanities makerspaces offer students an accessible and welcoming space to work on projects or learn experientially, especially compared to their STEM and art counterparts.

4.2. *Adam*: "And part of the library, too, I think, gives us a unique ability to reach out and be available for a lot of people. Libraries are generally for everybody, so that kind of gives us a leg up on being accessible or inviting, at least, to lots of people."

Ammon: "Yeah, so we do fill that gap for engineering students that don't have a space or home that they can go to."

Leah: "There is separately a letterpress at our Studio Arts School, and they've—the people involved in that have been very generous about collaborating. But we have different aims, and frankly, the work that we produce in the Book Initiative makerspace—I mean the people at the Art School are very polite

about it, but obviously we're not producing stuff of the quality that they're producing. It's more about the process than about the product."
Jonathan: " So like, we needed to exist to fill that kind of bibliographical press function that grew out of libraries rather than the art studio function, which has its own sort of pedagogical purpose."
4.3. I think this point also connects to Matthew's discussion of BookLab as a collaborative social space that welcomes all kinds of folks. Related to ideas of accessibility and inclusivity.

Theme 5: Community Engagement
5.1. While humanities makerspaces sometimes implement public programming or event outreach, their primary audience is their immediate institutions.
5.2. *Adam*: "It's always been accessible to students, faculty, and staff of the university, of NC State University. We kind of tied it to that set of groups because that's our really core audience for the library. And we were never really positioning ourselves as a big outreach project of the university, of the library."
Ammon: "We don't, like, proactively go out and publicize to the community our resources. Just because that's not our primary, you know, primary function."
Matthew: "The short answer is, we try. It's always a little bit hard to get folks even just physically onto campus, like, you know. Where do you park, that sort of thing."
Patricia: "And so that—the community has reached out to me, saying, do you want to do community activities? And I do, and I don't, because the community would love it, and maybe we'd get an endowment that way. But it's hugely time consuming and expensive as an initial endeavor on my part."
5.3. Many interviewees expressed an interest in community engagement and mentioned past events or programs that were advertised to the larger community. However, they also noted that it's difficult to bring in people or to make time for community organizing. Several makerspaces mentioned that community members come in to make projects (Ammon, Quinn). Matthew, Kirstyn, and Patricia also mentioned that they collaborate with local letterpress organizations.

Theme 6: Makerspace Movement
6.1. Through critical making and hands-on approaches, humanities makerspaces participate in the broader maker movement.
6.2. *Kirstyn*: "And I think I absolutely see it participating, especially among, you know, the folks that were on the panel at the MLA. I know that printing does so much for students' thoughts about process and materiality and critical thinking. I think it absolutely is part of the broader makerspace movement."
Matthew: "BookLab is the maker movement for English majors and book people and humanities folks."

Patricia: "It's called the maker movement, as you know, and. This is—the making labs are all part of the maker movement."
Stephen: "No, I do think it's part of a DIY, makerspace initiative."
6.3. Quinn and Matthew talk about their university's broader makerspace initiatives/consortiums, and they both note how being connected to these networks is beneficial. However, several participants mentioned that they did not necessarily see any connections between their space and the makerspace movement—Jonathan expressed a skepticism for the movement, while Quinn expressed a lack of time to get involved.

Theme 7: Accessibility
7.1. Humanities makerspaces interpret accessibility in two ways: first, they think about accessibility as *who* can enter the space and *how*; second, they think about accessibility in terms of dis/ability. The majority of makerspaces do not have accessibility plans or issues, but rather considers accessibility on a case-by-case basis.
7.2. *Adam*: "And I think it's very, like, case-by-case, like. You know, we have a very responsive hands-on approach of, like, you ask us for something and we do a lot to try to meet your need."
Ammon: "Yeah, and we I, you know, we haven't had a lot of issues come up with people not being able to access our equipment or use it. But it's definitely something on my mind."
Kirstyn: "Yeah, well, and I have one more thing to add, which is that Alan Hillashime was the expert at the San Francisco Center for the Book who taught me my platen press course and certification, and I had asked him about accessibility during that course, and he said—he's been teaching platen press for twenty to thirty years, and he has always found a way to have someone with whatever disability or accessibility need print. You might not be able, you know—right like. So there's always a way to have someone orient themselves around the wheel or around the flywheel, or you know—I don't know. He said that he's always been able to find a way. And I don't quite know what to do with that."
Stephen: "I have not had a student with a—I'm trying to think—a physical limitation. I have not. I have not, so I wouldn't even know how to address that if that is, in fact, part of your question."
Quinn: "I think if it did, we'd try to figure something out like we do for everyone. But like so far, it hasn't really come up."
7.3. While most makerspaces do not know how to address accessibility, some makerspaces have thought about accommodations for students with disabilities. For example, several makerspaces we interviewed have accessible equipment or spaces, while others offer accommodations like closed captioning. BookLab notably has braille books and kits for students to use.

Theme 8: Inclusivity

8.1. As with accessibility, humanities makerspaces interpret inclusivity in two ways: first, they consider inclusivity in terms of interdisciplinarity; second, they consider inclusivity in terms of diversity.

8.2. *Adam*: "So that focus on like, being welcoming, bringing in folks who, you know, weren't already kind of trained or raised that like—this was the space that was for them, and these tools are tools that were for them."

Matthew: "And you know it's also we do see a lot of diversity in the space. I think it does have a reputation as being a safe space and multiple kinds of ways, and a lot of that—I'm hoping there's an opportunity to talk about our graduate assistants, too, who are a crucial part of what we do. But a lot of, I think that kind of outreach and kind of embrace of other constituencies that might not necessarily be obvious to me is a function of who our graduate assistants are and you know what their—what they bring to the space."

8.3. Some makerspaces note that they have a difficult time bringing in disciplines outside of their primary audience (for example, Leah and Kirstyn note that their audiences are primarily English students, while Adam discusses how mostly STEM students use their space).

Theme 8: Challenges

9.1. Humanities makerspaces struggle with institutional bureaucracy, which poses challenges for funding, staffing, space, and overall survival of the initiative.

9.2. *Adam*: "So that is just fundamentally challenging organizationally, like. You know, even if we can show all the data and tell all the stories of why we need it. I just like—once you get out of these like set channels of funding and institutional organization, it's just like there's not a space for it, you know."

Kirstyn: "I feel like we're fighting for its survival a little bit, if I can be candid."

Leah: "And then I'd say the other challenge is—but a much smaller challenge—is just the logistics-intensive—or, the fact that English departments, like the one in which this press is based, are not good at dealing with, are not set up for dealing with logistics-intensive undertakings.

Patricia: "And then they told me, 'you have to leave this room in one month,' and I got a petition signed by 150 people—which they did not like me doing—saying, this is really, really, really important, which is how I got the bigger space."

9.3. Nearly every makerspace we interviewed cited funding and staffing as primary challenges. The interviews revealed several examples where interviewees tirelessly advocated to maintain or improve their initiative (Kirstyn, Patricia) or expressed overall concern about the initiative's survival in the long-term (Jonathan).

Theme 10: Successes

10.1. Humanities makerspaces find success in facilitating positive learning/making outcomes for visitors and staff.

10.2. *Adam*: "Those are certainly high points for me, of just seeing like these particular individuals who've been supported."

Ammon: "And then I think I'm most proud of my student-workers. Like, they are awesome in coming up with really fun and creative ideas for workshops."

Kirstyn: "Their face lights up right there, it's just joy. It's like, I don't know, Fort-da object permanence. Discovering, you know, discovering that you've made something cool."

Quinn: " Here, let's make a scarf, and they come in, and they make it, and they're in, and they're happy."

10.3. Affect plays a role here—satisfaction and happiness are at the forefront of these responses, which also connect to a few instances where Kirstyn and Jonathan talk about witnessing the joy on someone's face when they pull a print for the first time.

Appendix III: Interview Questions

Initial Themes	**Interview questions**
Mission and Scope	● What is your makerspace/lab's mission? ● Describe the lab's audience, space, tools, and programs.
Disciplinary Roles	● What is the perceived value of the maker lab to the humanities more broadly? ● How do you seek to balance research and pedagogical activities, if at all? ● Can you describe a time when you (or someone working in your lab) gained an insight into historical or cultural knowledge that would have not been possible without interacting with the physical fabrication tools in the lab?
Outcome - DEI (Diversity, Equity, and Inclusivity)	● Do you think your makerspace appeals to people who may not otherwise find themselves in humanities? Can you elaborate? ● In what ways, if at all, the lab contributes to the inclusive ways of learning and discovery of history or other humanities disciplines?

	• How does your lab address accessibility issues, particularly with historical equipment not designed for accessibility?
Outcome - Connecting the Past-Present-Future	• How would you describe the connections between your lab and the contemporary maker movement, if any? • What does the historical media tell you about the current maker/personal fabrication culture?
Outcome - Broader Impact	• In your opinion, what is the perceived value of the maker lab in your local departmental/campus environment? • How do you interact with other makerspaces on campus, if at all? • Does your lab engage local communities? If so, how?
Success	• What does success look like to you? What are you most proud of?
Challenge	• What are the biggest challenges your initiative faces?
Snowball Sampling	• Are there any humanities maker labs you would recommend us to speak to?

Appendix IV: Makerspace Information

Makerspace	Institution	Department(s)	Technologies
Blue Satellite Press	Millikin University	English	Letterpress/printing
BookLab	University of Maryland	English	Papermaking, letterpress/printing, book binding, zine making, textiles, 3D modeling/historic reproduction, gaming/game design
Digital Humanities Initiative	Santa Clara University	College of Arts and Sciences	Letterpress/printing, bookbinding
Maker Lab	University of California, Santa Barbara	English	Letterpress/printing, 3D modeling/historical reproduction
Makerspace	NC State University	Library	Textiles, wearable technology, 3D modeling/historical reproduction, VR/AR/immersive environments, 3D printing, CNC milling, laser cutting, physical computing
Media Archaeology Lab (MAL)	CU Boulder	College of Media, Communication and Information	
Scarlet Letterpress	Rutgers University	English	Papermaking, letterpress/printing, book binding, risograph/mimeograph
Skeuomorph Press & BookLab	University of Illinois Urbana-Champaign	School of Information Science	Letterpress/printing, zine making, risograph/mimeograph, vintage computing
Text Technologies Press	University of Wisconson-Madison	Information School	Textiles
Textiles Makerspace	Stanford University	Division of Literatures, Cultures and Languages	Paper making, letterpress/printing, book

			binding
TinkerTank, Scholars' Lab	University of Virginia	Library	Letterpress/printing, zine making, risograph/mimeograph, textiles, wearable Technology, vintage computing, 3D modeling/historical reproduction, gaming/Game Design, VR/AR/Immersive Environments, electronics, resin casting

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