Threading Logic

REINTERPRETING LACE THROUGH CODE, TYPOGRAPHY, AND INTERACTIVE DESIGN

“Could anything be more laughable than a woman claiming artistic status for her sewing? In the nineteenth century, when women had learned not to claim creative merit for embroidery but to assert that it was labour for love, men mocked it as a mere pastime, just one of many trivial occupations which filled a woman’s day.”

— Rozsika Parker, The Subversive Stitch, p.172

Introduction

Figure 1. Torchon lace edging featuring tally-petalled flowers, half-stitch diamonds, and a double Torchon ground. The pattern is finished with a scalloped headside and a twisted footside, exemplifying the structured geometry characteristic of Torchon lace.

Source: Jo Edkins, Lace Collection – Pattern 232, theedkins.co.uk (Accessed May 2025).

This report critically examines how undervalued traditional crafts—specifically lace-making—can be preserved and reinterpreted through digital tools and systems. Lace, like many historically feminine crafts, is often dismissed as decorative and nostalgic rather than acknowledged as a logical, culturally significant design system. In an era of algorithmic culture and digital acceleration, lacemaking stands at a pivotal juncture—threatened by erasure yet ripe for revival. This report investigates the implications of translating lace into digital form, exploring how such transformation may reframe authorship, labour, and the systems we value in design. Drawing on craft theory, feminist critique, interaction design, and preservation ethics, this is more than documentation—it is a cultural and design-led enquiry into history, identity, and representation.

As a designer working with generative typography,

pattern logic, and code-based interactivity, I am drawn to the structures that underpin visual form. Lace emerged to me not merely as an aesthetic but as an intricate, methodical, and algorithmic system. My interest in lacemaking was not born from nostalgia but frustration—why is this labour-intensive, logically structured craft so marginalised in design discourse? Why is it not viewed as a precursor to digital logic? What began as a speculative experiment developed into an ethical enquiry into whose labour is preserved, whose histories are celebrated, and whose systems are legitimised.

This is not a historical study of lace but a design-led investigation through it. My project employs computational tools—including p5.js, SVG rendering, and interactive UI elements—to create a generative type system informed by lace's structural logic. These tools enabled a novel engagement with lace, translating its grid-based planning and repetition into responsive, interactive digital form. This report runs in parallel with the Unit 10 portfolio, which focuses on visual outcomes; here, I foreground the intellectual, cultural, and ethical frameworks underpinning that work.

The report unfolds across four interconnected chapters. First, I explore lace's cultural and gendered history, drawing on feminist craft theory to understand its devaluation. Second, I examine preservation ethics, considering how disappearing systems of making might be archived or sustained through digital means. Third, I focus on digital reinterpretation, evaluating the opportunities and risks of translating embodied craft into code. Finally, I reflect on my practice-led methodology, tracing how the lace-type generator evolved and how design functioned as research. Visual material—including diagrams, screenshots, and process imagery—accompanies the text where relevant, serving not as embellishment but as discursive evidence.

This enquiry is guided by the following research question:

How can digital tools serve as a method for reinterpreting and preserving the legacy of lacemaking?

The question is approached through theory, case studies, critical reflection, and practice-led enquiry—treating digital design not as mere replication but as cultural translation.

Cultural Origins and Feminist

Exploring feminist legacies and craft hierarchies in digital reinterpretation

Historical Context

Lace-making, like embroidery, knitting, and crochet, belongs to a lineage of textile practices long associated with domesticity, femininity, and passivity. Traditionally performed in private spaces by women—often unpaid or working-class—lace symbolised refined womanhood while excluded from the "serious" design category. This contradiction between labour and status forms the foundation of lace's marginalisation.

Despite requiring immense manual skill, geometric planning, and logic—traits celebrated in architecture or typography—lace was dismissed as an ornamental excess: delicate, fragile, and inherently feminine. Bobbin lace, developed in 16th-century Europe and sustained via cottage industry models into the 20th century, demonstrates modularity and mathematical rhythm. However, its cultural visibility remained confined to elite display—upper-class bodies, ceremonial settings—obscuring the labour behind it. As E. Wayland Barber writes in Women's Work, textile history is also the story of "how women created and managed complex industries—and were then erased from the historical record." (Barber, 1996)

Comparing lace to woodworking or architecture reveals how the production site—public workshop vs domestic parlour—shaped notions of skill, authorship, and value. These legacies still inform who is seen as a designer and what counts as design.

Feminist Craft Theory

Feminist theorists have long argued that textiles are devalued because of their association with femininity, domesticity, and amateurism. In The Subversive Stitch, Rozsika Parker dismantles this framing, noting:

> **"Embroidery... was made in the domestic sphere, usually by women, for 'love': Painting... by men, in the public sphere, for money... Rather than acknowledging that needlework and painting are different but equal arts, embroidery and crafts associated with 'the second sex' or the working class are accorded lesser artistic value." (Parker, 1984)**

This dismissal of women's work as leisure reveals how gendered ideologies have shaped our view of design. Parker argues that embroidery—and, by extension, lace—was excluded from design history not for lack of structure but due to its femininity.
Griselda Pollock echoes this, asserting that art history works through exclusion: if women's labour is included, it is categorised as tradition, not innovation. Textile practices thus remain visible in form but not in discourse.

In Thinking Through Craft, Glenn Adamson critiques the positioning of craft at the bottom of the design/art hierarchy. He argues that qualities like patience, repetition, and embodied skill are culturally coded as antithetical to masculine-coded ideals of originality and disruption. Lace, with its subtle variation and precision, contradicts this modernist value system.

These exclusions have real implications for design education. While tools like CAD or generative systems are presented as advanced, "soft" crafts are rarely discussed as complex systems with logic. Nevertheless, lace operates through repetition, input/output logic, and encoded memory—features recognisable in any parametric design process.
Craft's framing as emotional or therapeutic has further reinforced its marginality. One artist interviewed by Stylist noted: "Textile arts don't get seen as intellectual because they're emotional... but what's wrong with being emotional in your practice?" (Stylist, 2019). The issue is not the emotion itself but how it has been used to devalue craft as non-critical.

This framing persists in digital spaces. Programming languages are associated with profound logic, while tools like Adobe Illustrator are seen as surface-level. Feminist writers challenge this hierarchy by linking textile logic to systems thinking, suggesting that so-called "soft" crafts encode structural complexity often overlooked in mainstream digital discourse.
Throughout this project, theorists like Parker, Pollock, and Adamson have anchored my thinking. Treating lace-making as a design system is both a political act and a methodological stance. It asserts that historically sidelined forms of making belong within code libraries, typography engines, and generative design tools.

Craft vs. Tech Dichotomy

To view lace purely as an ornament is to miss its underlying structure. Lacemaking is fundamentally a system: it relies on grid-based logic, ordered repetition, and rule-based execution. Bobbin lace involves precision intertwining threads and forming motifs across rows and columns—comparable to scripting a repeatable function.

Lace charts operate like visual scripts: pattern sequences are layered and modified using logic akin to programming. Parameters like tension, spacing, and thread count must be resolved before one loop is tied. Lace shares more with algorithmic drawing than decoration. Terms like "nodes," "threads," and "loops" apply in both textiles and code.

However, only the latter is recognised as technical or innovative. This reflects a broader gendered hierarchy: labour-intensive feminine crafts are framed as intuitive or emotional, while machine-

based systems are considered rational and scalable. Software is not neutral—it carries the ideologies of its makers. Coding has become masculinised, while lace is linked to domesticity and care. Nevertheless, their structures are parallel. Recognising this is not semantic—it is political. It asks us to rethink which logic systems are legitimised and which are sidelined (Chun, 2011).

Ethical and Personal Position

This enquiry is personal. As a designer navigating digital and traditional systems, I view lace as a hidden architecture. Making lace charts and decoding their loops reshaped my thoughts about “systems.” I was struck by how little lace occupies in discussions celebrating complexity in other forms—especially code.

This project pushes back. It is about aesthetics and visibility: making legible an undervalued knowledge system. I believe in open access, inclusive design, and preserving overlooked forms of intelligence. Translating lace into code is not replication but cultural and intellectual recovery.

Figure 2. Women making lace. Watercolour after Q. van Brekelenkam, c.1800. Wellcome Collection. Public Domain.

Figure 3. Lace-makers of Bruges. Illustration from Bobbins of Belgium: A Book of Belgian Lace, Lace-Workers, Lace-Schools and Lace-Villages by Charlotte Kellogg, 1920. Public domain.

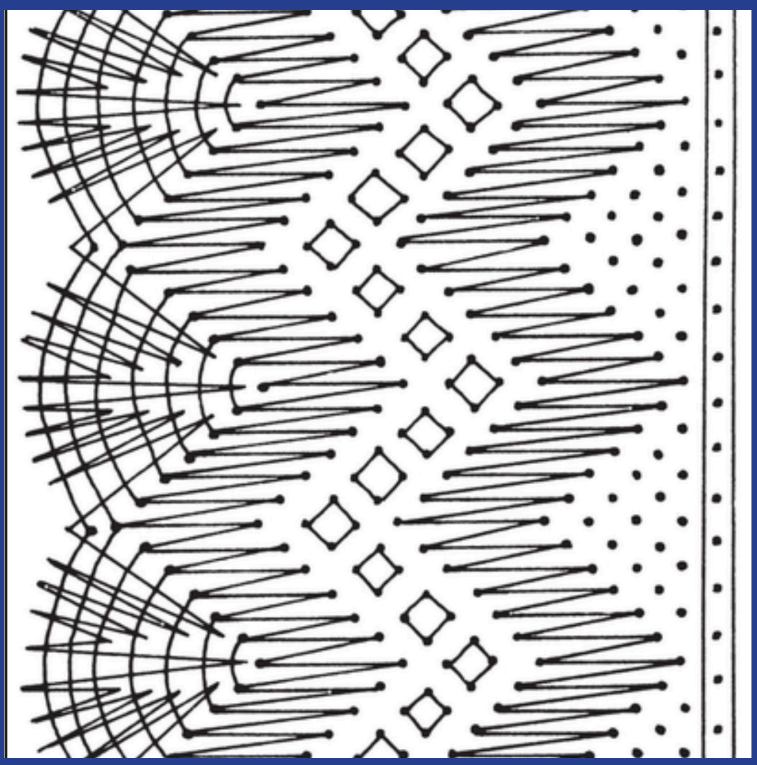

Figure 4. Excerpt from a lace fan pattern diagram (Figure 30) illustrating Torchon lace construction. Source: Fuhrmann, B. (1976) Bobbin Lace. New York: Watson-Guptill Publications

Preservation and Education

What does it mean to preserve a disappearing system of making?

Craft Loss in the Digital Age

In recent decades, we have witnessed the moderate disappearance of manual and localised practices—traditions once passed down through repetition, observation, and physical participation. Skills like hand-weaving, calligraphy, oral storytelling, hand-developed photography, and lacemaking have increasingly been displaced by automation, algorithmic tools, and the standardisation of production. While new technologies have made creative processes more accessible in some respects, they have also contributed to the decline of embodied, intergenerational knowledge systems. The loss is not just one of aesthetics or artefacts but of the ways of knowing embedded in these practices.

Lacemaking sits firmly within this pattern of cultural erosion. Once widely taught in domestic and formal settings and recognised as economic and cultural labour, lace has primarily fallen out of educational curricula, museum focus, and everyday application. Its survival depends mainly on passionate individuals and grassroots organisations rather than institutional support. The disappearance of lace echoes that of endangered languages: once its grammar—the logic of how it is constructed—is lost, reviving it authentically becomes exponentially more difficult. Similarly, like oral traditions, lace relies on shared memory, gesture, rhythm, and context. A pattern book cannot fully replicate the tacit knowledge gained through watching someone wind bobbins or adjust the tension by feel. When we lose these processes, we do not just lose beauty—we lose intelligence.

Arguments for Preservation

Why, then, should we preserve something like lace? The answer lies in sentiment and material, cultural, and epistemological value.

Firstly, there is material value: antique lace, handmade tools, and inherited patterns constitute tangible links to past economies, labour systems, and local crafts. Many of these artefacts are fragile, unique, and embedded with the time and memory of their makers. Preserving them maintains a record of design history that goes beyond dominant narratives of industrial progress.

Secondly, the cultural value of lace is immense. Lace carries intergenerational memory, often through women's stories and skills excluded from formal archives. In some regions, a place functions as a community identity—techniques and motifs are shared across families or taught within convents and passed down with care and purpose. This gendered and place-based knowledge risks being permanently lost without meaningful documentation or reinterpretation.

Thirdly, and critically for my project, lace holds deep epistemological value. It is a system of thinking: mathematical, procedural, precise. To preserve lace is a form of algorithmic reasoning predating the computer—-pattern loops, knot logic, and spatial memory. In this sense, lace is not simply a visual decoration but a language. Preserving this language contributes to a more inclusive understanding of design history—one that honours non-linear, non-dominant, and often invisible logic systems.

Preservation must, therefore, go beyond the visual. It is not enough to display a lace collar behind glass. What matters is the preservation of method, rhythm, and relationship: the timing of thread movements, the tension between bobbins, and the knowledge that exists not in books but in hands. This is what theorist Michael Polanyi called tacit knowledge—knowing that cannot be fully explained, only practised. (Polanyi, 1966). In my work, I see preservation as not nostalgia but resistance. Traditional crafts offer a model of slowness, precision, and care in a design world obsessed with novelty and scale. They challenge the logic of disposability and continuous disruption. As a designer, I feel an ethical responsibility to engage with these systems—not to replicate them romantically, but to understand what they can teach us about future design values.

Debates and Counterpoints

Of course, preservation is not neutral. It can easily veer into nostalgia or cultural freeze-framing—treating practices like lace as relics to be conserved in static form. Terms like heritage essentialism and craft romanticism are helpful here: they name the risk of fetishising the past without allowing it to evolve.
Preservation should be dynamic, not mummified. This raises crucial questions: Who gets to decide what is worth preserving? Is it scholars, institutions, practitioners, or communities themselves? Preservation efforts can feel extractive without active engagement and reinterpretation—like placing a living tradition into a glass case. For example, when fashion houses appropriate lace aesthetics for haute couture without referencing its cultural origin or makers, the result is aesthetic flattening rather than critical homage.

Thus, my approach to preservation is one of translation. It insists on movement—across materials, media, and meaning.

Case Studies and Precedents

This project draws on the efforts of individuals and organisations dedicated to preserving and reinterpreting lace traditions. Jo Edkins, a British bobbin lace practitioner and educator, offers a comprehensive website with historical context, clear pictures, interactive tools, and digital tutorials. In

my interview, she noted the urgency of “getting the knowledge down before it disappears”—particularly the logic of thread movements and the challenge of visualising them. (Edkins, 2025 – see Appendix A). Her site is a preservation tool in both function and spirit: open-access, community-driven, and pedagogically rich.

Other notable examples include lace institutions in Slovenia, Belgium, and other countries, where educational and cultural programmes have increasingly responded to shifting interest and access. Some now experiment with new fibres, colours, or geometries, while others maintain traditional practices. Though complete online transitions are rare, websites and digital resources suggest a broader move towards accessibility and adaptation.

From a more speculative angle, projects like Open Source Embroidery (initiated by Ele Carpenter and no longer available) combined textile craft and code, exploring how shared languages emerge across making systems. These projects point toward what preservation can look like in contemporary contexts: not storage but interface—a way of making old systems accessible, adaptable, and open to reinterpretation.

My work differs from these precedents because it focuses on interactive, user-responsive design. Rather than documenting place, I have built a tool that allows users to generate their lace-like forms by manipulating digital parameters. In doing so, I aim not to mimic lace but to preserve its logic—constraints, variation, and interdependence—as a living design language translated into code.

Digital Reinterpretation

Transformation, translation, or mimicry?

Tools and Methods

The development of my lace-inspired typography tool relied on a combination of computational systems and visual experimentation. I worked primarily with p5.js, a JavaScript library for creative coding that enabled me to create real-time generative scripts for drawing curved thread forms. Each glyph is rendered using a parametric design structure: customisable variables such as wave amplitude, thread speed, colour, and offset are controlled through an interactive UI of sliders and colour pickers. These parameters echo the rule-based variability of lacemaking, where different thread tensions or bobbin placements yield distinct outcomes.

Visual rendering was achieved using SVG (Scalable Vector Graphics), chosen not just for clarity and scalability but also because its path-based logic mirrored the continuous thread behaviour of lace itself. By layering three Bézier curves per thread—highlight, mid-tone, and shadow—I created a digital illusion of spatial depth that echoed lace's woven dimensionality.

These tools were not chosen for convenience but for their conceptual alignment with lace's logic: repeatable, rule-driven, and modular. Just as traditional lace patterns vary regionally and by the maker, my tool's customizability invites user experimentation—allowing each output to be unique. The interface design was guided by principles of intuitive play, prioritising visual feedback and gesture-based interaction to evoke the exploratory spirit of physical making. However, translating tactile, tension-based material into screen logic brought challenges. Replicating gesture, irregularity, and weight required abstraction and compromise. This translation process made visible both the power and the limits of digital tools in representing embodied craft.

Accessibility and the Internet as Archive

The rise of digital platforms has allowed niche craft knowledge to survive, adapt, and circulate globally. Once shared only through workshops, printed manuals, or apprenticeships, lace-making now exists in a digital archive—forums, video tutorials, digitised pattern books, and open-source tools. This environment is not merely a storage space but an active system of preservation and reinterpretation.

In my interview with Jo Edkins, a bobbin lace educator who has maintained one of the most comprehensive lace websites since the early 2000s, she emphasised the urgency of documenting lace-making processes—particularly the logic of thread movement—before such embodied knowledge is lost. (Edkins, 2025 – see Appendix A). Her site includes animations of thread crossings, explanations of stitches, and downloadable patterns—resources now accessed worldwide. Edkins' work exemplifies how digital tools can extend the lifespan of embodied knowledge, exceptionally when maintained with care, community feedback, and a spirit of openness.

My lace-type generator is within this lineage. Like Edkins, I am not trying to replicate traditional lace but to make its logic interactable—to allow others to see, touch, and transform its systemic depth through code. In this way, the tool contributes to the broader project of digital preservation: not archiving finished objects but opening systems of knowledge to participation and reinterpretation.

Platforms like Hand-weaving and niche forums like r/Bobbinlace on Reddit show how open-source and community-led archiving are key to keeping lesser-known crafts alive. These are not passive repositories but active learning environments shaped by accessibility, decentralisation, and care.

Conceptual Weaving

The metaphor of weaving has long been used to describe digital systems. Threads become data, loops become logic, and nodes become connection points. Just as lace interlaces paths to create space and structure, digital networks also create meaning through patterned interconnection. In both, the whole only emerges through tension, repetition, and system memory.

This conceptual alignment is echoed in Sadie Plant's cyberfeminist framing, where she writes: "Women have always spun, woven, and worked textiles. They are the weavers of the web, the spinners of the yarns." (Plant, 1998) In this light, lace becomes not a relic but an early system of networked intelligence—a visual algorithm with cultural specificity. Thinking of lace not just as a textile but as a proto-code reframes its role in design discourse entirely.

Critique of Digital Translation

While digital tools offer new ways to reinterpret traditional practices, they are not neutral. Translation always involves loss. In the case of lace, what disappears in the shift from physical to digital is often the bodily, tactile, and temporal knowledge—the sense of thread weight, the rhythm of the hand, and the constraints of fatigue or breath.

This raises important questions: Is digital reinterpretation an act of mimicry (aesthetic copying),

homage (referential borrowing), or transformation (a new system built from an old logic)? My tool attempts the latter—but I recognise that interactivity alone cannot replicate physical sensation. What it can do, however, is illuminate a system and invite users to participate in its structure.

There is a risk that abstraction erases cultural origin, feminist lineage, and regional specificity, flattening tradition into aesthetic. Therefore, reinterpretation must be intentional and critically positioned, acknowledging its limits and reach. To digitise lace is not to preserve it wholesale—it is to propose a conversation about what parts of its logic, ethics, and memory we choose to carry forward.

Comparative Case Studies

Several contemporary projects navigate similar territory, each making different decisions about preservation and transformation. For instance, Turing Pattern Textiles, an algorithmic weaving initiative, uses biological pattern logic (like zebra stripes or coral growth) to generate weavings with dynamic repetition. Though grounded in mathematics rather than heritage, it reflects a similar interest in systems-based making.

Platforms like TurtleStitch, a visual programming tool for generative embroidery based on Snap!, and PEmbroider, an open-source Processing library for programmatically creating stitch files, demonstrate how creative coding environments are increasingly merging with textile production. These tools allow users to design embroidery patterns through algorithmic logic—transforming sound, geometry, or code into thread-based outputs. Both platforms reflect a growing ecosystem of open-source, experimental craft software that blurs the boundaries between engineering and ornament. While their goals differ—TurtleStitch focuses on education and visual logic, and PEmbroider offers parametric precision—they both support a culture of accessible, shareable tools that honour making as both a technical and expressive act.

In contrast to archival tools or visual filters, my lace-type generator is interactive, user-responsive, and ethically grounded. It invites the user not to consume lace visuals passively but to engage with its structural thinking. It reveals what lace has always been—a system—and what digital design can become when informed by undervalued histories.

Project-Specific Exploration

Practice-led research and designing with lace logic

Design Methodology

The central outcome of this project is a generative lace-type system—a digital tool that visualises text through structures inspired by lacemaking. Designed in p5.js and rendered using SVG, the tool allows users to manipulate the formal behaviour of glyphs through an interactive interface. The system simulates lace-like threads interweaving across each letterform, creating variable patterns through a custom-built UI that controls wave amplitude, threading speed, node spacing, and colour composition. This is not just a drawing tool—it is a reinterpretation engine that translates the logic of lace into code and makes that logic responsive to user input.

The visual language of the tool is based on Bézier thread structures, each letterform rendered as a modular field of connected points. Threads—composed of three Bézier curves to simulate shadow, mid-tone, and highlight—are plotted dynamically between nodes that shift based on the user's chosen parameters. This layering technique was chosen to mirror traditional lace's visual depth and textural richness while introducing a sense of spatial movement. Threads curve, overlap, and shimmer as if under tension—creating an illusion of weight and interdependence that is computational, not tactile.

I began developing the tool by analysing how lace patterns function as code: loops and motifs, geometric grids, repetition, and variation. These logics were translated into computational terms:

1. Grid structure became layout logic
2. Thread connection was rendered via Bézier curves
3. Pattern modulation was controlled through live sliders

By treating lace as a system, I aligned it with parametric and generative design practices—valued in digital environments but rarely associated with crafts like lacemaking. This alignment allowed me to confront the gendered assumptions around what counts as "technical" or "designed," reinforcing that lace is not a relic of feminine ornamentation but a programmable, adaptive structure.

Interactivity plays a critical role here. Rather than

rendering fixed designs, I designed the tool to encourage experimentation. As users adjust sliders and colour values, they effectively co-create—shaping patterns in real-time through intuitive, visual feedback. This moves the project beyond static preservation, transforming it into a platform for generative authorship, where each output is structurally faithful to lace logic and subjectively expressive. It also creates a conceptual bridge between craft and code: both rely on rules, repetition, and physical or digital touch. In this sense, the tool becomes a living system where the knowledge of lace is enacted, not archived.

Iterative Process

The tool evolved through a series of critical iterations, each informed by technical constraints, aesthetic experimentation, and user feedback. The earliest version relied on a geometric sphere-based layout: point ellipses were plotted across the text, and threads were drawn as simple lines between fixed locations. While this produced a pleasing abstract structure, it lacked the layered richness and movement I associated with lace.

The next iteration introduced Bézier rendering for curves, allowing for more dynamic thread movement and the illusion of stretch or slack. This was a pivotal shift. Suddenly, the type began to "breathe." Threads could bow and arc, simulating the structural give of textiles under tension. From here, I implemented a layered approach: each thread rendered in three strokes (highlight, mid, and shadow), allowing visual weight and light to become part of the system's expressiveness.

Refinements were then focused on UI structure and performance. Early versions had ungrouped sliders that confused user flow. I reorganised controls into logical columns: offsets, amplitude, speed, and colour—each labelled with textile-inspired terminology to create conceptual coherence. Mobile responsiveness was addressed through layout scaling and simplified sliders, ensuring interaction remained fluid across screen sizes. One minor but significant addition was the "highlight thread" colour channel, introduced after early exports, which appeared visually flat. This single adjustment dramatically enhanced the perceived dimensionality of the output.

Another major shift came in the form of the website design of the main page and my decision to control the auto-movement of the decorative elements. In early builds, all threads moved uniformly, which looked artificial. I modified the sketch so each thread moves at different speeds and directions—some responding to cursor movement, others drifting independently. This created a more lace-like irregularity and mirrored the variability of handmade work.

Each of these changes was not simply aesthetic. They were outcomes of design-led enquiry—moments where a glitch, a test, or a visual failure led to more profound insight into lace logic or interaction. In this sense, the iterative process became a form of research: every design choice asked a question, and every refinement articulated a possible answer.

Ethical and Audience Considerations

This work was designed not for preservationists or technologists alone but for a broad and an interdisciplinary audience. My ideal users include :

1. Young designers exploring generative typography
2. Craft practitioners interested in computational reinterpretation
3. Educators teaching systems thinking through visual form
4. Feminist researchers studying undervalued knowledge systems

Accessibility was central to my thinking. I deliberately avoided advanced coding barriers or obscure UI structures, aiming for a playable, intuitive, and visually generous tool. My belief in design informed this openness as a site of shared learning—a space where historical systems can be made visible, available, and relevant again.

Throughout, I have reflected on authorship and representation. This project does not aim to “speak for” lace-makers or to fix lace in a singular interpretation. Instead, it invites others to engage with its logic, reshaping it through their input. I see this as collaborative translation, where craft is not appropriated but activated through a shared interaction system.

I hope this tool might be used in educational or speculative contexts—whether in design classrooms, workshops on feminist coding, or even heritage discussions about digital preservation. The aim is to create a dialogue between historical forms and contemporary systems.

Utopian Threads

What would it mean if lace and systems like it were treated not as design curiosities but as foundational design logic? This project imagines a future where lace is no longer marginal but central: a design model based not on disruption or minimalism but

interdependence, slowness, and repetition.

Such a shift would ask digital tools to take on new qualities—ones often excluded from the design mainstream. What if software embraced pattern-based thinking, embracing nuance and complexity over speed? What if interface design were shaped by cultural memory, allowing users to explore layered, symbolic systems rather than flat UX templates? What if generative tools were built on feminist logic—valuing care, process, and open knowledge?

This work is speculative but not utopian in the escapist sense. It is grounded in what already exists: the quiet intelligence of lace, the hands that made it, and the systems they built long before “systems design” was a discipline. My tool proposes a future rooted in that past—a future where what we design is new and more just.

As Ruha Benjamin reminds us in Race After Technology, “Imagination is a contested field of action, not an escape from reality but a collective blueprint for it.” In creating this tool, I am preserving a form and proposing a blueprint where digital systems are built from threads that remember where they came from.

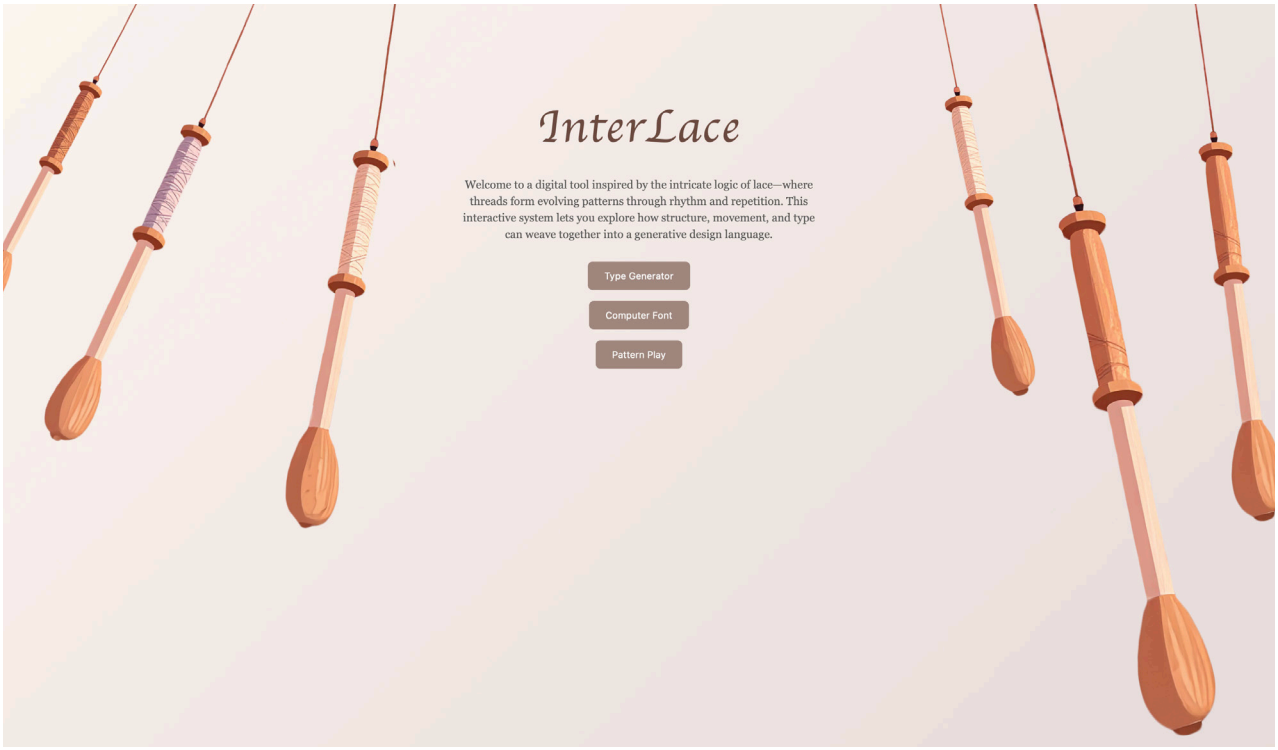

Figure 5. Screenshot of the project's index page. Bobbins elements animate in response to user input, visually referencing hanging threads and traditional tool arrangements.

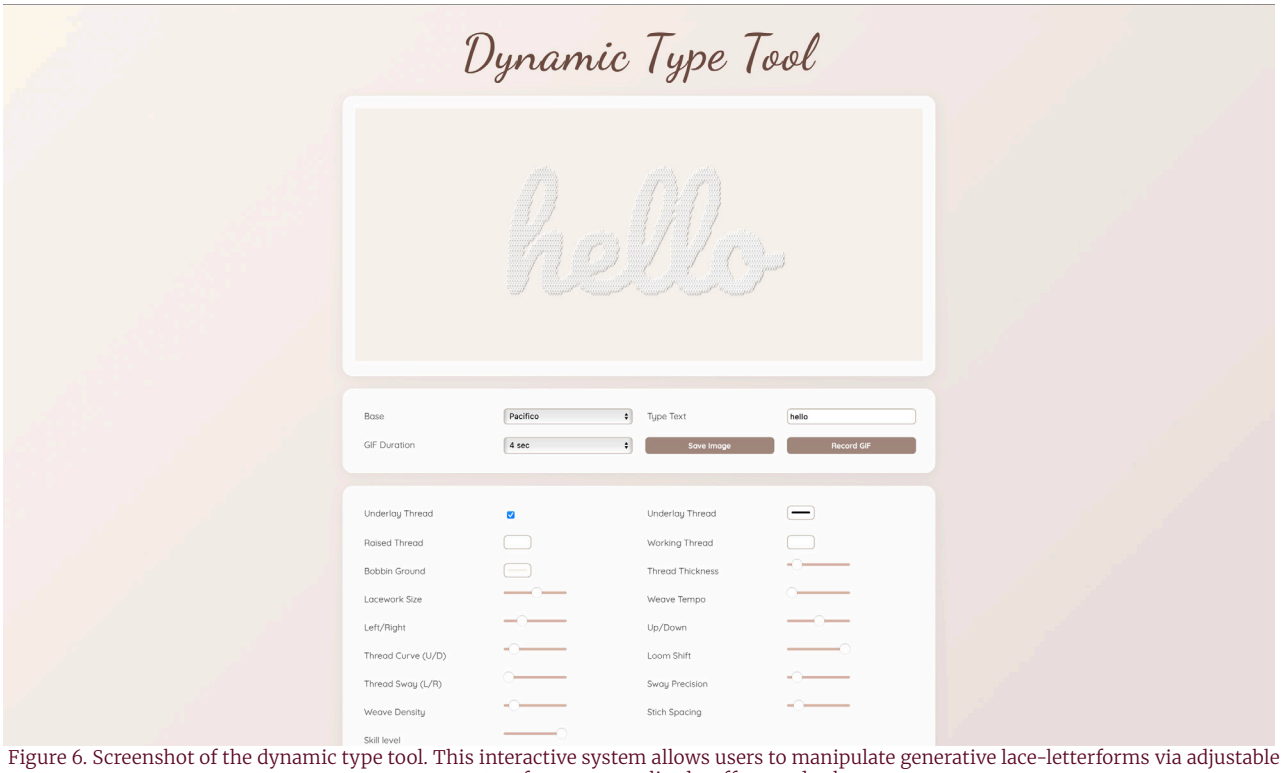

Figure 6. Screenshot of the dynamic type tool. This interactive system allows users to manipulate generative lace-letterforms via adjustable parameters for wave, amplitude, offset, and colour.

Conclusion

Summary of Findings

This investigation set out to answer the question:
How can digital tools serve as a method for reinterpreting and preserving the legacy of lacemaking?

Through cultural critique, design theory, and practice-led experimentation, this report has explored how lace-making a system deeply embedded in historical, gendered, and manual traditions—can be translated into contemporary computational contexts. In the first chapter, I examined how lace has been culturally undervalued due to its association with domestic femininity and emotional labour. Drawing on feminist craft theory, I argued that lacemaking is not a decorative hobby but a systemic, intellectual practice.

In the second chapter, I investigated the ethics and politics of preservation, asserting that to preserve lace is to preserve a way of thinking—an epistemology grounded in care, repetition, and embodied logic. The third chapter addressed the challenges of digital reinterpretation. While digital tools offer new ways of sharing and activating craft knowledge, they also risk flattening it into aesthetic surface or interactive novelty. The fourth and final chapter detailed my generative type tool as a translation method that foregrounds lace's structure and invites users into the system rather than observing it from a distance.

This enquiry ultimately uncovered that lace and systems like it—contain knowledge that has long been undervalued yet urgently matters. These systems offer counter-narratives to dominant models of innovation and design, insisting on an alternative logic rooted in relationality, material intelligence, and feminist critique.

Design Ethics Reflection

This project fundamentally reshaped how I understand design—not just as a method of problem-solving but as a tool for cultural excavation, critique, and reconfiguration. Where I once saw lace as a visual motif, I now recognise it as a language—a system of encoded relationships and constraints. Engaging with it through code allowed me to rethink what design preserves and what design includes.
Ethical questions emerged at every stage. What does it mean to represent a craft I do not practice with my hands? How can digital translation avoid aesthetic appropriation and instead honour the logic of making? What forms of knowledge are we preserving, and for whom? These questions led me to adopt a

feminist, systems-based, open-access approach that foregrounds participation over authorship, structure over the surface, and collaboration over control.
I now define my practice as one between systems—bridging traditional knowledge and digital logic, cultural memory and generative design. I see design as a means of creating form and a medium of reflection, resistance, and rewording.

Limitations

While this report and accompanying tool represent a meaningful intervention, the work has clear limitations. Time and scope constraints meant that I could not sufficiently explore the regional specificity of lace forms—how particular styles developed in different cultural, political, or geographic contexts. Similarly, I could not engage in more profound collaborative research with current lace-makers or craft collectives whose perspectives would have enriched the project further.

Technically, the tool could be expanded with more robust accessibility options or export formats, and the UI could still be refined based on user testing. Finally, this report could not fully address embodied coding practices—how bodily movement, gesture, or proprioception could be integrated into design systems more explicitly. These areas represent important directions for future exploration.

Future Directions

This project is not an endpoint. It is a beginning—a foundation I intend to build upon as I begin my MSc in Data and Artificial Intelligence. At first glance, the fields of lace and AI may seem disparate. Nevertheless, both are logic, pattern, and meaning-making systems at their core. I believe that the feminist, critical, and cultural frameworks explored in this report will inform how I approach data structures, machine learning models, and human-computer interaction in the future.

I am particularly interested in questions of cultural data preservation—how marginalised histories and vernacular knowledge can be ethically encoded in algorithmic systems. What would it look like to build AI tools that reflect care-based design values or make the labour of knowledge-making visible in ways that resist surveillance, bias, or erasure? How can interfaces be built for underrepresented knowledge systems, treating data not as abstract input but as situated narrative?

This report has already begun to suggest some answers. I have learned that code can carry memory, design can reveal the power, interactivity can be a form of pedagogy, and old systems—lace among them—can guide the ethics of emerging ones.
Going forward, I hope to position myself as a designer-researcher who bridges digital systems and cultural critique. One who builds tools not only for efficiency but also for understanding. One who codes not only with logic but with care.

Bibliography

Adamson, G. (2007) Thinking Through Craft. Oxford: Berg Publishers.

Kellogg, C. (1920) Bobbins of Belgium: A Book of Belgian Lace, Lace-Workers, Lace-Schools and Lace-Villages. New York and London: Funk & Wagnalls Company.

Barber, E.W. (1996) Women's Work: The First 20,000 Years: Women, Cloth, and Society in Early Times. New York: W.W. Norton & Company.

Benjamin, R. (2019) Race After Technology: Abolitionist Tools for the New Jim Code. Cambridge: Polity Press.

Bradford, M.E. and Company, B.B. (1892) A Treatise on Lacemaking, Embroidery, and Needle-Work with Irish Flax Threads. London: Bradford.

Butterick Publishing Company (2014) The Art of Modern Lacemaking (1891). Reprint ed. Literary Licensing, LLC.

Chun, W.H.K. (2011) Programmed Visions: Software and Memory. Cambridge, MA: MIT Press.

Cook, B.M. and Stott, G. (2014) The Book of Bobbin Lace Stitches. London: Batsford Books.

Jackson, J. (2021) Super Subversive Cross Stitch. Seattle: Sasquatch Books.

Parker, R. (1984) The Subversive Stitch: Embroidery and the Making of the Feminine. London: Women's Press.

Plant, S. (1998) Zeros + Ones: Digital Women and the New Technoculture. London: Fourth Estate.

Pollock, G. (1988) Vision and Difference: Feminism, Femininity and Histories of Art. London: Routledge.

Polanyi, M. (1966) The Tacit Dimension. London: Routledge & Kegan Paul.

Jones, L., Stewart, M., Shereck, S.A., Lintag, J., Doherty, D., Bucchino, B. and Nabil, S. (2025). Interactive Bobbin Lace: Metal Thread History, Interviews with Lacemakers, and Material Explorations with E-textiles. pp.1–18. doi:https://doi.org/10.1145/3689050.3704957.

Heffer, C. (2021) Reimagining lace in a digital space. FormAkademisk – forskningstidsskrift for design og designdidaktikk, 14(2). Available at: https://doi.org/10.7577/formakademisk.4408 (Accessed: 25 March 2025).

Jeon, B.S., Bae, J.H. and Suh, M.W. (2003) Automatic Recognition of Woven Fabric Patterns by an Artificial Neural Network. Textile Research

Journal, 73(7), pp.645–650. Available at: https://doi.org/10.1177/0040517503073007l4(Accessed: 15 April 2025).

Lehrecke, A., Tucker, C., Yang, X., Baszynski, P. and Dahy, H. (2021) Tailored Lace: Moldless Fabrication of 3D Bio-Composite Structures through an Integrative Design and Fabrication Process. Applied Sciences, 11(22), p.10989. Available at: https://doi.org/10.3390/app112210989 (Accessed: 17 April 2025).

Princeton Engineering. (2021) Technique inspired by lace making could someday weave structures in space. Princeton University. Available at: https://engineering.princeton.edu/news/2021/06/01/technique-inspired-lace-making-could-someday-weave-structures-space (Accessed: 17 April 2025).

Reddit. (n.d.) r/Bobbinlace. Available at: https://www.reddit.com/r/BobbinLace/ (Accessed: 20 February 2025).

Studio Ten Design. (n.d.) Turing Pattern Collection. Available at: https://studio-ten-design.com/collections/turing-pattern (Accessed: 14 May 2025).

Stylist Magazine. (2019) Why Traditional Women's Crafts Are Finally Being Seen as Art. Available at: https://www.stylist.co.uk/life/womens-textiles-crafts-female-skills-sexism-not-seen-as-art-anni-albers-tate/233457(Accessed: 13 March 2025).

Hedva, J. (2016) Sick Woman Theory. Available at: https://www.kunstverein-hildesheim.de/assets/bilder/caring-structures-ausstellung-digital/Johanna-Hedva/cb6ec5c75f/AUSSTELLUNG_1110_Hedva_SWT_e.pdf (Accessed: 16 April 2025).

TurtleStitch. (n.d.) TurtleStitch: Embroidery with Snap!. Available at: https://www.turtlestitch.org/ (Accessed: 25 May 2025).

Creative Inquiry. (n.d.) PEmbroider: Embroidery Library for Processing. GitHub. Available at: https://github.com/CreativeInquiry/PEmbroider (Accessed: 14 March 2025).

Edkins, J. (n.d.) Jo Edkins' Bobbin Lace School Website. Available at: https://www.theedkins.co.uk/jo/lace/index.htm (Accessed: 10 March 2025).

Fuhrmann, B. (2012) Bobbin Lace. New York: Dover Publications.

Handweaving.net. (n.d.) Digital Archive of Historic Weaving Patterns. Available at: https://www.handweaving.net/(Accessed: 20 February 2025).

Kantcentrum (n.d.) Lace Centre & Museum - Kantcentrum. Available at: https://www.kantcentrum.eu/en/welcome(Accessed: 10 May 2025).Visit Bruges+2kantcentrum.eu+2kantcentrum.eu+2

Čipkarska šola Idrija (n.d.) Online lacemaking workshops. Available at: https://www.cipkarskasola.si/izobrazevanja-2/online-lacemaking-workshops/?lang=en (Accessed: 10 May 2025).

Edkins, J. (2025) Interview with the author, 10 May. Transcript included in Appendix A.

Appendix A

Interview Transcript – Jo Edkins (2025)

This appendix presents the full transcript of an email interview conducted in May 2025 with Jo Edkins, a British bobbin lace practitioner, educator, and digital archivist. The interview is reproduced here to support the critical report's analysis of digital craft preservation and reinterpretation. Edkins reflects on her practice, lace-making's evolution, digital platforms, and the logic underpinning lace as a cultural and systemic design form.

Q1. Many of the lace patterns on your website are visualised through pixel-level design and repetition. Do you think this pixel-based approach is especially suited to capturing the logic of lace, and why?

Jo Edkins: I would not say it is especially suited to lace as a medium—it is just especially suited to how I think. It is very slow, but it allows me full control and mirrors how my brain works. Lace has flowing curves, and working pixel-by-pixel can be too mechanical, but I tweak and revise as I go. Most people use graph paper or specialist software, and I just like the clarity and pacing of Paint.

Q2. In our previous conversation, you described lace-making as a system of movements and decisions—especially around structuring stitches. Would you say lace has a kind of 'visual logic' or internal grammar that could be compared to code or typography?

Jo Edkins: Lace definitely has an internal grammar. You start with a number of threads and end with the same number. Every crossing follows a logic—under-over-under-over. There are different "grammars" in different lace styles. I compare designing lace to writing a computer program—the design is the program—but the metaphor breaks down because the lacemaker isn't a computer! That said, the same part of my brain lights up when I design lace as when I code.

Q3. You have spoken about the challenges of learning lace before digital resources were available. How do you think digital platforms and tools—like your website, animations, or even YouTube—have changed the way lace-making is accessed and preserved?

Jo Edkins: It has transformed access. You can now type "How do I make bobbin lace?" into Google and go from there. That was not possible before. YouTube is a massive tool for visual learners. My site functions like a book, with diagrams, stitch instructions, and free patterns. I have had people tell me they learned lace just from my website. It is no longer hierarchical—

anyone can join in.

Q4. You have designed and shared your own lace patterns online for free—something quite radical in a field that often relies on books and traditional teaching. What inspired you to take that open-access approach, and how has it influenced the community?

Jo Edkins: It was never about money—it is a hobby. I like teaching, and I had the skills to build a website. I believed it would be useful. And it has been—people have told me it has helped them learn. Some have even called me "THE Jo Edkins," which makes me laugh!

Q5. You have mentioned the evolving community around lace and how digital communication has flattened hierarchies, encouraging experimentation. How does this openness impact how lace is made, shared, or reimagined creatively?

Jo Edkins: Beginners now get a wide range of answers to their questions, which is brilliant. It used to be top-down—teachers, books, experts. Now, it is horizontal. Facebook groups, forums, YouTube—people mix styles, invent new stitches, and learn things they would not have come across otherwise. I think the experimentation is more visible and more celebrated.

Q6. What do you think is the most misunderstood aspect of lace-making by people outside the craft—either in terms of complexity, value, or cultural significance?

Jo Edkins: People think it is visually delicate, so it must require good eyesight. It does not! It is not about vision—it is about logic and understanding structure. As for value, lace is basically worthless financially. The labour is immense, and the market does not reflect that. Culturally, people forget that lace was once industrial. Machine-made lace killed the profession. Now it survives as a hobby, but the pride and tradition are still strong, especially in certain countries.

Q7. If you could pass on one thing to a new generation of designers or creatives interested in lace—not just as a craft, but as a cultural or conceptual system—what would it be?

Jo Edkins: Just try it. You will find out for yourself if it is fun or not. And if it is, you will be hooked.

Appendix B

Community Responses – Lace Pattern Design Methods

This appendix includes anonymised community responses to an open-ended question shared with lace-makers across online forums and groups. Participants were invited to share how they design their lace patterns using software, graph paper, or other methods. These insights help contextualise Jo Edkins' approach within a broader contemporary practice and reflect the diversity of tools, traditions, and experimentation among today's lace-making community.

Prompt shared:
"This is for people who design their own lace patterns. How do you do it? Do you use graph paper and pen? Do you use a grid and pen? Do you use computer software? Do you start with an existing pattern, but do some bits differently (a spider rather than some rose ground, for example)?"

Selected Responses:
1. "I do mine by hand. Grid if appropriate, or hand drawings. Pencil and paper and tracing paper."

2. "I use Lace8 software. I create motifs like fans or trails and store them in my library. So much easier for long patterns. Wanting to learn/practice this far more!"

3. "I use a lace design program. It is the earlier version of Lace8. I design all my Bucks designs on it. When I first purchased the program, I sat with a simple Torchon bookmark and plotted it dot by dot so I could get used to using it."

4. "For Torchon, I start with a pencil on graph paper, then draw up in 'Graphic', an app I bought for my Mac. I used to use Illustrator, but now I cannot justify the monthly cost. For Milanese, always by hand."

5. "Illustrator: Create logos, illustrations, graphics and more. Illustrator on the iPad works intuitively with your Apple Pencil."

6. "Pencil and whatever paper you choose. Lace8 is great but very expensive."

7. "I have only designed one thing – a mask cover. I traced the shape, added motifs using dotted paper, and rearranged them till I liked the design. Then I made a clean copy to work from."

8. "For Binche design, I was taught to use pencil and grid paper. Lots of erasing! A friend redrew my design using Inkscape. I would still start by hand."

9. "I draw by hand and then onto graph paper, which needs tweaking to fit my original drawing. Time-consuming, but it is mine. I sign and post it to myself

as proof of authorship."

10. "Nothing wrong with Paint. My 10-year-old son used it pixel by pixel, and now he is a graphic designer!"

These responses offer a glimpse into contemporary lace-makers' rich analogue and digital approaches. Many combine traditional hand methods with digital editing tools, and several express appreciation for slower, hands-on processes despite the availability of advanced software.

Appendices A and B support the project's critical exploration of lace as a living system, revealing how craft logic continues evolving through individual experimentation and communal exchange in physical and digital spaces.

WERONIKA
ELZBIETA
FALINSKA