

Digital Embroidery Tactile Patches at the Intrepid Museum

SensiStitch Final Report

PRESENTED BY KIANNA EDDY, TAMI ALTSCHULER, YUANQING LI

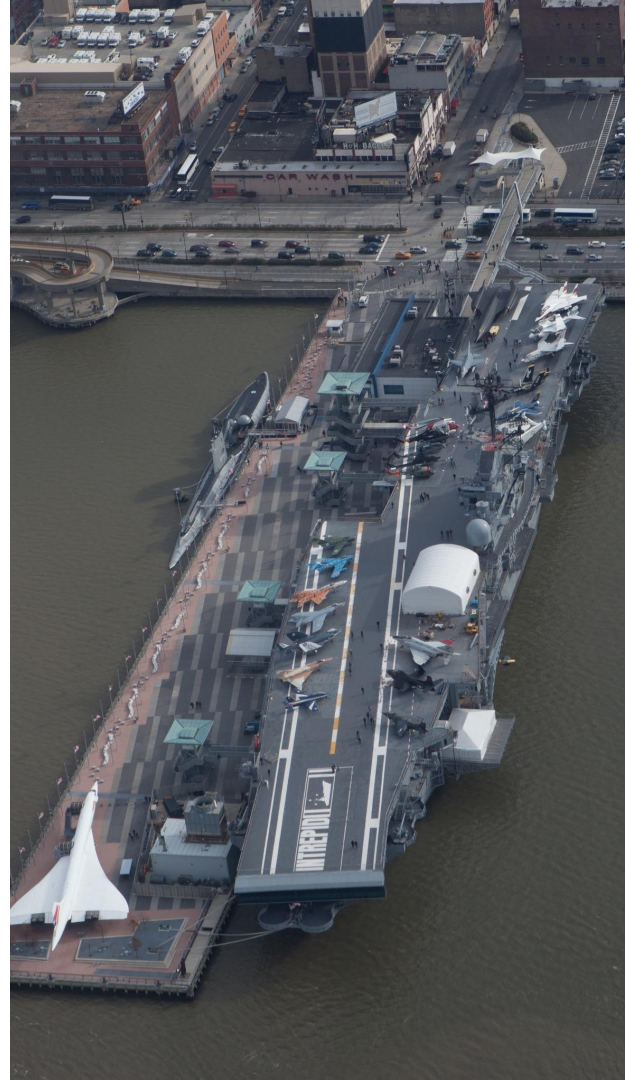
05/07/2024

Content

- Overview on Intrepid and Accessibility
- Project Goals
- Previous Work
- Competitive Analysis
- Fabrication Process
- User Testing Results
- Considerations for Future Steps

The Intrepid Museum

- An aircraft carrier turned into a floating museum
- Showcases historic aircraft, spacecraft, and maritime artifacts
- Immersive journey through military and technological history



BLV Accessibility at the Intrepid

- Self-Guided Tours: Verbal Description and Tactile Guides use raised images, Braille, large print, and a talking pen
- Touch Tours: Replicas and models of the ship for visitors to touch and orient to their current location, guided touch interactions

Accessibility Optimization

Alternative formats of artifacts are needed for people who are BLV to engage, interact, and comprehend the item displayed

Inclusive Design

Provide tactile representations of museum artifacts to enhance the Intrepid Museum experience for individuals who are BLV and for everyone

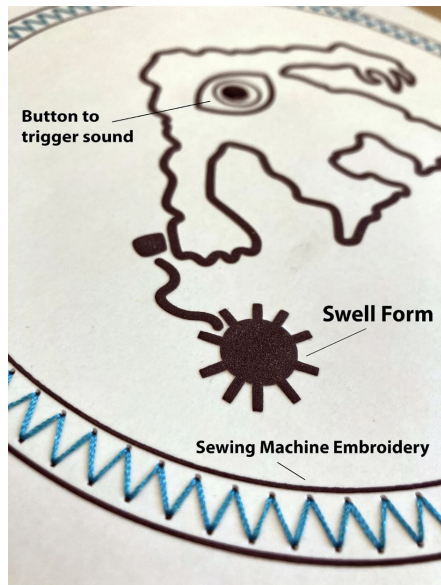
Project Goals

1. Create designs that accurately convey information from the patches through touch alone
2. Choose the right materials that can withstand frequent handling while maintaining their tactile integrity
3. Engage with the museum visitors to receive feedback on the effectiveness and usability of tactile representations

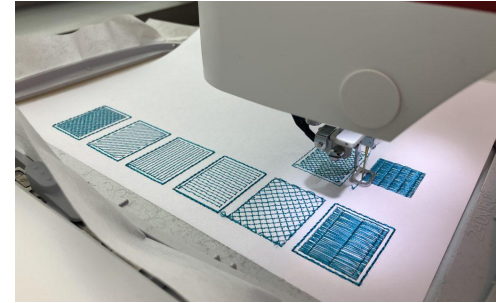
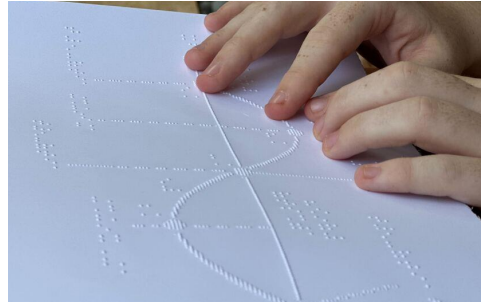
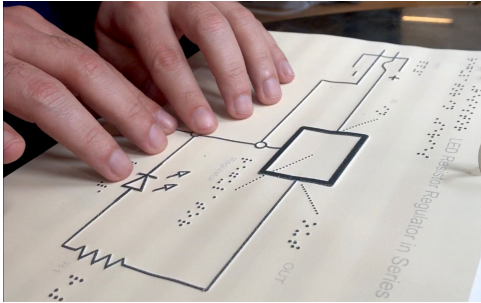
Previous Work

Stefanie Koseff (our mentor):

- Recognized importance of patches
- Lack physical interaction in museum
- No interactive audio component on the website
- Used combination of embroidery, swellform, and audio
- **Previous project goal:** design tactile representations of military patches that can be put on display at the Intrepid Museum



Competitive Analysis



Swell Form

PROS

- Rapid Production
- Detail Representation
- Cost-Effective

CONS

- Durability Issues
- Limited Textures

Braille Graphics

PROS

- Widely recognized
- Low Cost
- Create with basic tools

CONS

- Not suitable for complex images
- Lacks the variety of textures

Digital Embroidery

PROS

- High Durability
- Textural Variation
- Aesthetic Appeal

CONS

- Requires specialized equipment
- Complexity to design and produce

Design Changes

Attack Squadron VA-65 Patch



First design for embroidery prototype

- Focused on defining lines
- Removed small details



Second design for embroidery prototype

- Increased size of patch
- Spaced out elements



Design Changes

Fighting Squadron 18 (VF-18) Insignia Patch



First design for embroidery prototype

- Decreased details in flames
- Spaced out objects

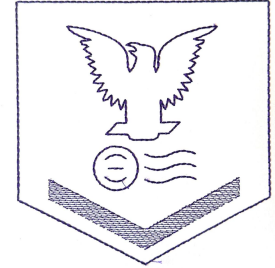
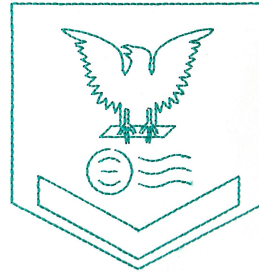
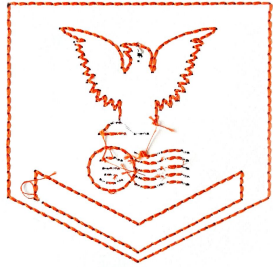


Second design for embroidery prototype

- Spaced out elements
- Removed overlapping lines

Design Changes

Postal Clerk Third Class Rating Badge



First design for embroidery prototype

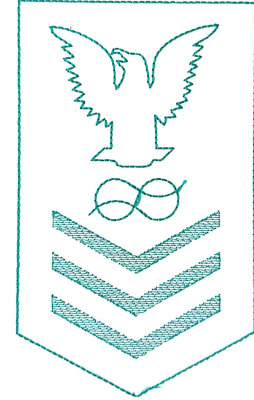
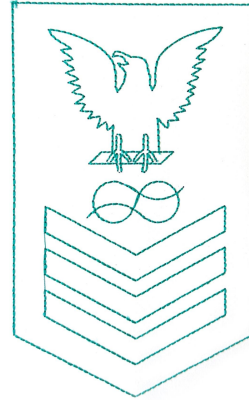
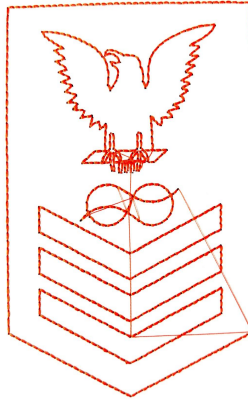
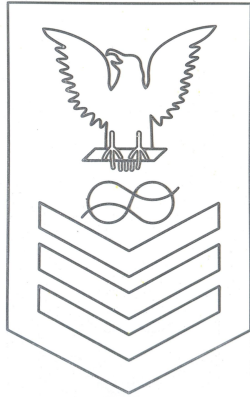
- Line work graphics of the patch.
- Threads are frayed on the intricate details of the embroidery prototype, and the paper is torn.

Second design for embroidery prototype

- Eliminate the eagle's eye and feet, along with the details of the postmark and the wavy lines on the rating insignia.
- Apply unique fill textures to the chevron.

Design Changes

Apprentice Petty Officer First Class Rating Badge



First vector design for swell form

- Line work to depict the graphics of the patch.

Second design for embroidery prototype

- Remove the details of the eagle's feet.
- Apply unique fill textures to three chevrons to tactilely differentiate them based on their distinct textures.

Challenges

- **Complexity:**
 - Knowing which details to include and which to remove to improve tactile legibility
- **Density:**
 - Paper rips if too close or overlapped with other stitches
- **Size:**
 - Larger patches are easier to embroidery and interpret

User Testing

- 4/27, 10am-6pm , 160 table visitors, 18 survey respondents
- **Does being able to touch the objects enhance your learning experience?** (15 responses)
Yes: 13
No: 2
- **Would you like to be able to touch reproductions like these patches or view only the original pieces?** (15 responses)
Yes, touch the patches: 12
Either: 2
Both: 1

User Testing

- **Does knowing that these are reproductions rather than original artifacts affect your interest or learning experience?** (15 responses)

No: 10

“I think there’s something exciting about touching the originals but I understand reproductions are necessary”

“I think it’s even cooler to have reproductions as it shows that there is lots of effort put into it”

Considerations for Future Work

- Design Changes: Use high quality thread to possibly limit breakdown, add different color stitches to the patches, include Swell Form and other tactile representations
- User Testing: Identify primary languages for visitors and have translation available, include hand sanitizer for infection control, offer small tactiles for takeaway (participation incentive)

Resources

<https://www.nationalmuseum.af.mil/Visit/Questions/>

<https://intrepidmuseum.org/events/join-program/groups-with-disabilities>

<https://intrepid.emuseum.com/groups/patches/results>

<https://www.hawaiipublicradio.org/local-news/2023-05-01/lawmakers-pass-bill-ensuring-schools-provide-timely-learning-materials-to-blind-students>

<https://wp.nyu.edu/ability/press-kit/>

<https://www.stefaniekoseff.com/recent-research/creating-tactile-graphics-with-digital-embroidery/>