

Ars Post Faber

Digital Fabrication democratization through
embodied knowledge preservation

by

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Abstract

Digital fabrication technologies have democratized access to production tools while perpetuating the industrial-era separation between design conception and material execution. This division, which historically diminished artisanship by fragmenting holistic creative processes, continues to manifest in contemporary CAD/CAM workflows that privilege computational precision over the embodied knowledge and tacit decision-making central to craft traditions. Current digital representation formats often reduce creation to pure geometry, failing to preserve the intimate material relationships and adaptive responses that characterize traditional making practices.

This research challenges the assumption that fabrication democratization is achieved solely through access to scaled-down industrial tools. Instead, it argues for a reimagination of the relationship between maker, material, and technology, seeking to restore the holistic nature of creative practice within digital contexts. The following study addresses how to preserve creative agency, embodied knowledge, and capacity for personal expression in digital fabrication contexts.

Through experimental tool testing and digital fabrication workshops with artisans and makers, this research develops *Ars Post Faber*, an open-source Grasshopper plug-in within the Rhinoceros CAD environment that approaches making as an integrated practice. The plug-in implements utilities designed to facilitate fluid Human-Software-Machine interactions, enabling embodied expression, contextual adaptation, and tacit knowledge to flow throughout the making process. Rather than abstracting away the creative journey, this approach looks to preserve the complete narrative of creation, including modifications, errors, and decision points, as integral components of the final work.

By attempting to bridge the gap between digital design and material execution, this research looks to contribute to evolving discussions around craft, technology, and creative agency in the digital age, suggesting that true democratization requires representational frameworks that honor the complexity and continuity of human creative processes.

Keywords: craftship, digital fabrication, human-machine interactions, preservation, democratization, artisanship

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Chapter 1

introduction

Digital fabrication has revolutionized manufacturing [2].

Chapter 2

literature review

Recent work on 3D reconstruction [4] and neural radiance fields [7] shows promising results.

Chapter 3

methodology

Following the craftsman approach [6], we developed...

Several studies [3, 1, 5] have explored...

Chapter 4

results

This is the results chapter.

Chapter 5

discussion

This is the discussion chapter.

Chapter 6

conclusion

This approach [see 8, p. 15] emphasizes...

Bibliography

- [1] Dave Beech. *Art and postcapitalism: Aesthetic labour, automation and value production*. Pluto Press, 2019.
- [2] Neil Gershenfeld. *Fab: The Coming Revolution on Your Desktop-from Personal Computers to Personal Fabrication*. Basic Books, 2007.
- [3] Neil Gershenfeld, Joel Cutcher-Gershenfeld, and Alan Gershenfeld. *Designing Reality: How to Survive and Thrive in the Third Digital Revolution*. Basic Books, 2017.
- [4] Yicong Hong, Kai Zhang, Jiaxiang Gu, Ke Sun, Sai Bi, Yang Zhou, and Feng Liu. Lrm: Large reconstruction model for single image to 3d, November 2023.
- [5] Bruno Latour. *Reassembling the social: An introduction to actor-network-theory*. Oxford University Press, 2005.
- [6] Richard Sennett. *The Craftsman*. Penguin Random House, 2009.
- [7] Matthew Tanc, Ben Mildenhall, Pratul P. Srinivasan, Ren Ng, Ravi Ramamoorthi, and Jonathan T. Barron. Nerf: Representing scenes as neural radiance fields for view synthesis, March 2020.
- [8] Janet Wolff. *The social production of art*. Macmillan Education, 1981.

Appendix A

appendices

This is the appendices chapter.