

**AN ODE TO WABI-SABI:
HOMAGE TO A GREAT AND WONDERFUL PERSON**

by
Wabi-sabi Admirer

A dissertation
submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Computing
Boise State University

December 2022

© 2022
Wabi-sabi Admirer
ALL RIGHTS RESERVED

BOISE STATE UNIVERSITY GRADUATE COLLEGE

DEFENSE COMMITTEE AND FINAL READING APPROVALS

of the dissertation submitted by

Wabi-sabi Admirer

Dissertation Title: An Ode to Wabi-sabi: Homage to a Great and Wonderful Person

Date of Final Oral Examination: 1st December, 2022

The following individuals read and discussed the dissertation submitted by student Wabi-sabi Admirer, and they evaluated the presentation and response to questions during the final oral examination. They found that the student passed the final oral examination.

Wabi-sabi The Great, Ph.D.

Chair, Supervisory Committee

Aaa, Ph.D.

Member, Supervisory Committee

Bbb, Ph.D.

Member, Supervisory Committee

The final reading approval of the dissertation was granted by Wabi-sabi The Great, Ph.D., Chair of the Supervisory Committee. The dissertation was approved by the Graduate College.

DEDICATION

dedicated to Wabi-sabi

ACKNOWLEDGMENTS

The author wishes to express gratitude to Wabi-sabi. This work would have been partially supported by some particular grant, if there was one.

AUTOBIOGRAPHICAL SKETCH

Wabi-sabi Admirer was born admiring Wabi-sabi. Wabi-sabi Admirer has been tinkering with admiration of Wabi-sabi for a long time. Now it is time to be blessed by Wabi-sabi.

ABSTRACT

An *abstract* is a brief summary of the document. A typical abstract provides a brief introduction, enough to provide context for the document, explains the purpose of the thesis or dissertation or project, and summarizes the major results and conclusions. Keep in mind that a casual observer is likely to judge the content of the document by the abstract and title alone. (There is an old adage: “in a joke, the punchline comes at the end; in a paper [or thesis], it comes in the abstract.”) A single concise paragraph usually suffices for the abstract. If it spills onto a second page, it is probably too long.

TABLE OF CONTENTS

DEDICATION	iv
ACKNOWLEDGMENTS	v
ABSTRACT	vii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
LIST OF SYMBOLS	xii
1 Introduction	1
1.1 What is this?	1
1.1.1 Where are the style class files?	1
1.2 Get ready for Wabi-sabi	2
2 The Greatness of Wabi-sabi	5
2.1 Previous work	5
2.2 What are their names?	5

2.3	The code of Wabi-sabi	5
2.4	Other mysteries of Wabi-sabi	6
3	The not so great things about Wabi-sabi	8
3.1	Figures	8
3.2	Tables	9
4	Conclusions	11
4.1	What have we done so far?	11
4.2	Future directions	11
	REFERENCES	12
A	Timing Measurements	13
B	Experimental Setup	14

LIST OF TABLES

2.1	The Approximate Time of Parallelizing Each Code	7
3.1	Complexity of Selection and Search in Sorted Matrices	9
3.2	Comparison of Slow MPI Version and the Fast MPI Version	9
3.3	The Speedup of the MPI WRS Code and the HPF WRS Code	10

LIST OF FIGURES

2.1	Repeated Squaring Power Method	6
3.1	How to Correct Errors in a Fuzzy Image	8

LIST OF ABBREVIATIONS

LOL – Laughing Out Loud

OMG – Oh My God!

ROFL – Rolling on the Floor Laughing

LIST OF SYMBOLS

$\sqrt{2}$ square root of 2

λ lambda symbol, normally used in lambda calculus but it sometimes gets used for wavelength as well

CHAPTER 1

INTRODUCTION

1.1 What is this?

This is a template that allows you to typeset your dissertation (or thesis or project report) in the format approved by the Boise State Graduate College. It greatly reduces your typesetting work and helps you produce an aesthetically pleasing and consistent document. The template depends on a style class, titled `bsu-cs.cls` that was specifically designed for Boise State Computer Science students but would also work for students from other departments.

1.1.1 Where are the style class files?

Please consult the guide from Graduate College (Graduate College, 2021) for resolving any style issues that are not addressed by the style class files that are provided along with this document. The files associated with this style can be found on the GitHub website (Jain, 2025). The style class files modified for Quarto can be found on GitHub as well (Koehn, 2025).

The file `bsu-cs.cls` contains the formatting directives for the *bsu-cs* style. It is based on the standard `LATEX report` style with 12 point font option.

1. To create a new article using this format: `quarto use template CarolynKoehn/bsu-dissertation`.
This will create a new directory with an example document that uses this format.
2. To add this format to an existing document: `quarto add CarolynKoehn/bsu-dissertation`.
Then, add the format to your document options:

```
format:  
bsu-dissertation-pdf: default
```

1.2 Get ready for Wabi-sabi

So who is Wabi-sabi? We need a lot of text in here to see what happens when we hit the bottom of a page with text and try out things like footnotes ¹. So here is some extra stuff: ²

stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff
stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff stuff

¹What's not to like about footnotes, anyway? Brian O'Nolan and George MacDonald Fraser both used them to great effect.

²Too many footnotes, however, can be distracting.

[illegible]

CHAPTER 2

THE GREATNESS OF WABI-SABI

2.1 Previous work

The greatness of Wabi-sabi The Great derives from her early work as documented in her books (Great, 1922, 1952).

2.2 What are their names?

Please consult the articles Admirer (1970) and Admirer, Smith, & Doe (1972) for more details. Note that the references are cited by the last names of all authors for three authors or less. For more than three authors, “et al” can be used. This is based on the `cs1` file you add to your project folder.

Check the References on page [12](#) for an example of how to format the references.

2.3 The code of Wabi-sabi

Thesis and dissertation text is normally “double spaced.” It is customary to single-space literal code. Figure [2.1](#) shows a sample Java program.

```

/**
Compute x^n using recursive doubling technique. O(lg n) multiplications.
@param x  The base value, unlimited precision.
@param n  The exponent, an integer.
@return   The computed power as a BigInteger
*/
public static BigInteger power(BigInteger x, int n)
{
    BigInteger temp = x;
    BigInteger result = BigInteger.ONE;
    while (n != 0) {
        if ((n & 1) == 1)
            result = result.multiply(temp);
        if ((n = n >> 1) != 0)
            temp = temp.multiply(temp);
    }
    return result;
}

```

Figure 2.1: Repeated Squaring Power Method. This figure also serves as an example of the inclusion of literal code.

When you want to show an algorithm or equation, use the \LaTeX math environment denoted by $\$$ (Equation 2.1).

$$P(E) = \binom{n}{k} p^k (2-p)^{n-k} \quad (2.1)$$

2.4 Other mysteries of Wabi-sabi

Here is an itemized list of all the mysteries of Wabi-sabi.

- Mystery 1.
- Mystery 2.

- Mystery 3.
- Mystery 4.

Here is a simple pipe table (<https://quarto.org/docs/authoring/tables.html>).

Table 2.1: The Approximate Time of Parallelizing Each Code

Parallel library/language	WRS Code	OCS Code	ICSAMD Code
MPI	20 hours	2 weeks	1 month
HPF	3 hours	1 1/2 weeks	1 month

CHAPTER 3

THE NOT SO GREAT THINGS ABOUT WABI-SABI

3.1 Figures

Check Figure [3.1](#) for what happens when Wabi-sabi gets compiled. This example shows how to include an image (in PDF, JPG or PNG) into a Quarto document.



Figure 3.1: How to Correct Errors in a Fuzzy Image

3.2 Tables

Table 3.1 shows the formatting and labeling for a table. For complicated formats, you can use raw \LaTeX tables (<https://www.overleaf.com/learn/latex/Tables>) inside cross-reference div syntax (<https://quarto.org/docs/authoring/cross-references-divs.html>).

Table 3.1: Complexity of Selection and Search in Sorted Matrices

	Sorted $X + Y$	Matrix with sorted rows and sorted columns		Matrix with sorted columns
	$ X = Y = n$	$n \times m, m \leq n$	$n \times n$	$n \times m$
$k = \Theta(mn)$ or $\Theta(n^2)$	$\Theta(n)$	$\Theta(m \log(2n/m))$	$\Theta(n)$	$\Theta(m \log n)$

Here’s an example of a table created with imported data files and code processing with packages `tidyverse` and `kableExtra` in a code chunk (Table 3.2).

Table 3.2: Comparison of Slow MPI Version and the Fast MPI Version

Parameters			Process Number						
N	M		1	5	10	15	20	25	30
128	100	Slow MPI(secs)	2.11	3.91	5.78	8.26	10.91	14.17	19.47
		Fast MPI(secs)	2.10	1.20	1.56	1.95	2.79	3.22	4.07

Here’s an example of a table using raw \LaTeX code with no Quarto processing (Table 3.3).

Table 3.3: The Speedup of the MPI WRS Code and the HPF WRS Code

Parameters			Process Number						
N	M		1	10	20	30	40	50	60
128	600	MPI(speedup)	1	5.18	7.67	8.24	6.99	5.55	4.49
		HPF(speedup)	1	8.40	12.15	13.98	14.73	13.52	13.21
256	300	MPI(speedup)	1	6.70	7.74	6.47	5.19	3.72	2.94
		HPF(speedup)	0.99	7.24	9.65	10.58	10	9.48	8.73
512	150	MPI(speedup)	1	6.75	10.64	12.14	13.35	13.87	13.98
		HPF(speedup)	0.98	6.72	9.88	11.55	12.86	13.38	13.83
1024	75	MPI(speedup)	1	2.13	2.30	2.36	2.38	2.39	2.40
		HPF(speedup)	0.95	1.94	2.06	2.10	2.13	2.13	2.14

CHAPTER 4

CONCLUSIONS

4.1 What have we done so far?

4.2 Future directions

The coming revolution in Wabi-sabi-lets offers many opportunities for further research.

REFERENCES

- Admirer, W. (1970). An Analysis of Wabi-sabiism. *Journal of the Advanced Computing Wabi-Sabi*, 21(2), 272–287.
- Admirer, W., Smith, J., & Doe, J. (1972). Everyday Wabi-sabiism. *Journal of the Advanced Wabi-Sabi Computing*, 23(4), 272–287.
- Graduate College. (2021). *Standards for Preparation of Dissertations, Theses & Projects*.
- Great, W. T. (1922). *The World According to Wabi-sabi*. Wabi-sabiland: NoWabi-sabi Press.
- Great, W. T. (1952). *The World Without Wabi-sabi*. Wabi-sabiland: NoWabi-sabi Press.
- Jain, A. (2025). *Style files for PhD Dissertation or M.S. Thesis or Project*. Retrieved from <https://github.com/BoiseState/thesis-dissertation-template>
- Koehn, C. (2025). *BSU Dissertation Quarto Template*. Retrieved from <https://github.com/CarolynKoehn/bsu-dissertation-template-quarto>

APPENDIX A

TIMING MEASUREMENTS

Here is Appendix A. See [Appendix B](#) for the experimental setup.

APPENDIX B

EXPERIMENTAL SETUP

Here is Appendix [B](#).

