

HARVARD UNIVERSITY
Graduate School of Arts and Sciences



DISSERTATION ACCEPTANCE CERTIFICATE

The undersigned, appointed by the

Department of Music

have examined a dissertation entitled

Shapes: A Music Method for the Expert Beginner

presented by

David M. Forrest

candidate for the degree of Doctor of Philosophy and hereby
certify that it is worthy of acceptance.

Signature C. O. Hasty
Prof. Christopher Hasty

Signature Catherine Elgin
Prof. Catherine Elgin

Signature Peter Pesic
Dr. Peter Pesic

Date: September 4, 2023

Shapes:
A Music Method for the Expert Beginner

A dissertation presented
by
David M. Forrest
to
The Department of Music
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy
in the subject of
Music Theory

Harvard University
Cambridge, Massachusetts
September 2023

© 2023 David M. Forrest

All rights reserved.

Shapes: A Music Method for the Expert Beginner

Abstract

Shapes is a music learning method that shifts the notion of musical basics from music-theoretical *objects*, like notes, scales, chords, keys, and even particular musical works, to the *contexts* that underlie these ideas. It begins by using the keyboard as a mnemonic device to leverage a learner's implicit musical knowledge, enabling the learner to play along with any song they hear. From this foundation, it develops instrumental, analytical, and note reading skill, progressing gradually to an internal model of the instrument, and the ability to imagine sounds clearly in the mind's ear. Shapes exemplifies an alternative to beginner methods that present music as a whole built up from parts. It suggests, instead, that a learner begins with the whole, and uses musical tools to explore inexhaustible and particular aspects of that whole. The approach establishes a relationship with music-theoretical concepts more generally as playful, designed environments within which to have a particular experience of music.

A Note on the Format

This dissertation conveys its most central ideas through musical experiences, brought about through text, images, audio, video, animation, and interactive software. It is the experiences themselves—and not textual descriptions or analyses of the experiences—that are the epistemic medium. This mode of scholarship is not adequately captured in PDF format, and raises a question of how best to present the dissertation, and of how to archive it.

When ideas are conveyed through text alone, we can take for granted that the text brings about, and therefore implicitly represents—even embeds—the experience of the reader, as well as the experiences of future readers in unknowable future contexts. This extends to works conveyed through multiple, independent media. In the case of a composer's thesis, for example, the score, performance recordings, and textual commentary are each separate and complementary presentations that comprise the overall work. In a computer science thesis, source code may accompany the text, serving as both the product of creative work, and as a representation of its functionality.

In the case of this thesis, the textual content, media, and source code are not independent formats that complement one another. They are meant to be taken together as part of a single format that is capable of providing a meaningful presentation of the ideas. The balance of readability and archivability can no longer be taken for granted.

I have attempted to provide a thoughtful balance of these priorities, and to do so as simply as possible. The dissertation is designed to be read in a web browser. The frontend and backend code repositories that serve the presentation are included as supplemental files to this PDF. The Table of Contents contains links to a functioning implementation of these repositories, and the

supplemental materials contain instructions for running them locally when the functioning implementation is no longer supported. The links double as descriptions of the locations of individual files in the supplemental materials.

Of course, the broader environment within which a text is read, or the complete technological ecosystem within which a piece of software runs are outside the scope of archivability. The archivable format must therefore do more than provide instructions for how it is to be read. It must also allow a future reader to extract the principles by which it could be meaningfully reconstructed in a different technological ecosystem.

For this reason, I have built the dissertation using the simplest technology possible, with a focus on the content. Text is written in markdown so that it is easy to read when the application is not running. Lessons are static pages with minimal styling. Media assets for the lessons, such as music notation and recorded exercises are included as local files rather than generated programmatically. Code is written and commented to express its functionality, without using unnecessary frameworks or libraries. The database that serves the player is a SQLite database, which is fully contained within a single local file. The database file is accompanied by a text dump of all the data. And models that serve the API endpoints are fully written out as SQL queries.

In this sense, the format is indeed a textual representation of the intended experience, and a generalization of that experience. But it is also a means of presenting the ideas directly. My hope is that this solution will provide a meaningful reading experience for you, whenever you are.

Table of Contents

Title Page	
Copyright	
Abstract	iii
A Note on the Format	iv
Table of Contents	vi
Acknowledgments	viii
Dedication	x

Shapes Basics

Commentary: About Shapes	1
--------------------------	---

Lesson Sequences:

• Playing With Songs	
• Tactile Reading	
• Chord & Key Levels	
• Tonescapes & Tensions	
• Reading Imagery	
• Lesson 1: A Shape	lessons/01-a-shape
Commentary: Why Music Videos?	writing/why-music-videos
• Lesson 2: Different Shapes	lessons/02-different-shapes
Commentary: What Is a Shape?	writing/what-is-a-shape
• Lesson 3: A Group of Shapes	lessons/03-a-group
Commentary: Is This the Circle of Fifths?	writing/circle-of-fifths
• Lesson 4: Shape Fingerings	lessons/04-shape-fingerings
Commentary: The Centered Keyboard	writing/centered-keyboard
• Lesson 5: The Anchor Note	lessons/05-the-anchor-note
Commentary: What is the Anchor?	writing/what-is-the-anchor
• Lesson 6: Playing With the Anchor	lessons/06-playing-with-the-anchor
Commentary: Musical Structures	writing/musical-structures
• Lesson 7: Bass Notes	lessons/07-bass-notes
• Lesson 8: Matching A Shape	lessons/08-matching-a-shape
• Lesson 9: Notes In Time	lessons/09-notes-in-time
• Lesson 10: Changes	lessons/10-changes
Commentary: Chord and Key Levels	writing/chord-and-key-levels

• Lesson 11: Groups of Shapes	lessons/11-groups-of-shapes
• Lesson 12: Reading by Touch	lessons/12-reading-by-touch
• Lesson 13: A Tonescape and Tensions	lessons/13-a-tonescape-and-tensions
• Lesson 14: Imagination as an Instrument	lessons/14-imagination-as-an-instrument
• Lesson 15: Two Higher and Lower Commentary: What is a Tonescape?	lessons/15-two-higher-and-lower writing/what-is-a-tonescape
• Lesson 16: Reading by Ear	lessons/16-reading-by-ear
• Lesson 17: Switch To Number Names	lessons/17-switch-to-number-names
• Lesson 18: Reading by Touch Part 2	lessons/18-reading-by-touch-2
• Lesson 19: Moods	lessons/19-moods
• Lesson 20: Reading by Ear Part 2	lessons/20-reading-by-ear-2
• Lesson 21: Light and Heavy Tensions	lessons/21-light-and-heavy-tensions
• Lesson 22: Reading by Ear Part 3	lessons/22-reading-by-ear-3
• Lesson 23: Reading by Touch Part 3	lessons/23-reading-by-touch-3
• Lesson 24: Moods and Tensions Together	lessons/24-moods-and-tensions-together
• Lesson 25: Getting Inside of Moods	lessons/25-getting-inside-of-moods
• Lesson 26: Reading by Ear Part 4 Commentary: Shape and Standard Notation	lessons/26-reading-by-ear-4 writing/shape-and-standard-notation
• Lesson 27: Making Time Relative	lessons/27-making-time-relative
• Lesson 28: All Moods and Tensions	lessons/28-all-moods-and-tensions
• Lesson 29: Mood Notes Commentary: Chord-Modes	lessons/29-mood-notes writing/chord-modes
• Lesson 30: Incidentals	lessons/30-incidentals
• Lesson 31: Independent Solfege	lessons/31-independent-solfege
• Lesson 32: Free Play	lessons/32-free-play

Back Matter

[Appendix 1: Frontend Code Repository](#)¹

[Appendix 2: Backend Code Repository](#)²

¹ Archived in Supplemental Files

Viewable at: <https://www.github.com/shapesmusic/shapes-method>

Hosted at: <https://www.shapesmusic.com>

² Archived in Supplemental Files

Viewable at: <https://www.github.com/shapesmusic/shapes-backend>

Hosted at: <https://api-9q2sw.ondigitalocean.app>

Acknowledgments

This is a snapshot of an ongoing and deeply personal project. The people who have encouraged and supported Shapes are the people who have encouraged and supported *me*. I would like to express my heartfelt thanks to:

The programs and people who gave me opportunities to test and develop these ideas: The Southern California Conservatory of Music, Braille Music Division; The Community Music Center in San Francisco, CA, especially Pasha and William Thornton; Ana Campos and Sabrina Kay at After-School All-Stars, Los Angeles; The Meieran and Wike Families at The Wonderview Education Project; Starr Wayne and Greg Goddu at Harvard Westlake Middle School in Los Angeles; Darren Kote at the Cambridge Community Center's Hip Hop Transformation; and most recently, participants in the Experimental Music Practicum at St. John's College.

My friends in music industry who recognized a spark early on and fanned it: Seth Lichtenstein and Chip McLean, Michael Lehmann Boddicker, and Jeff Koz.

My friends in technology who have spent endless hours teaching me, coding with me, and wandering into philosophy of technology with me: James Kafader (who was also the first Shapes student), Klaus Voltmer, Justin Champappilly, Anton Maximov, and Lauren Davidson.

My parents for their unconditional love. And my dad for the genuine interest he has taken in Shapes throughout the years, his help with the playlist, and his remarkable attention to detail.

Mara Zehler, without whom this dissertation would be unlikely to exist at all.

My chosen family: Caitlin Doughty, Drury Brennan, Bradley Smith, and Nora Mapp.

My musical family: Grant Horrocks and Dory Bavarsky.

My Learning Lab Family: Casey Cann, Phil Lai, Katie Gilligan, Ilya Vidrin, and especially Marlon Kuzmick, for creating a place where this kind of scholarship is possible, and Jordan Koffman for (among many other things) showing me how to make learning playful.

Prof. Rob Wood for giving me an unlikely home in the School of Engineering, for trusting my unusual ideas about music, and for showing me, through his example, how to lead a team.

My academic colleagues and professors who taught and inspired me over the years, especially James Bean, Giulia Accornero, John Pax, Chloe Chapin, Eve O'Connor, and Audrey Wozniak; and Professors Alex Rehding, Suzy Clark, Roger Grant, Hans Tutschku, and Jeffrey Hamburger.

My committee members, Kate Elgin and Peter Pesic, for their generosity, for our many wonderful conversations, and for opening questions that will keep me thinking for many years to come.

And my advisor, Prof. Christopher Hasty, for a friendship and mentorship that is the stuff of dreams.

To My Students

You are my teachers, collaborators, and cherished friends

About Shapes

What does it *feel like* to be fluent in music? What does a skilled musician experience when they play their instrument, or when they use musical symbols? And how close can we come to that feeling, right from the beginning?

What if the “basics” of music aren’t the notes, scales, chords, keys, intervals, or the correct techniques for playing an instrument—but instead, are the intuitions that *generated* all those ideas and techniques in the first place?

If that’s the case, then you already have the basics. And you’re not by any means at the beginning. You’ve more likely arrived to a place where you feel the need to connect your experience to some musical tools and techniques—to bounce your intuitions off of something outside yourself, so that you can develop and refine those intuitions.

The difficulty is that so many of the tools that work so remarkably well for musicians are designed to do exactly that—to work remarkably well—but not to show you *how* they work. Music notation, for example, takes layers upon layers of different ways of experiencing music: its contexts, its departures from those contexts, its events in pitch and in time, the relationships between those events... and compiles them into a single, readable surface layer that lets musicians navigate any or all of these aspects at once, as they wish.

But when we encounter music notation for the first time, all we can see is its surface layer, not all the layers beneath it. And so we’re presented with our very same question about the basics: do we start by learning the individual notes, one by one, in the hope that eventually they will begin to transform into something greater than themselves? Or can we start from some of those deeper

layers, that are closer to what we already understand intuitively, and that are ultimately the source of that surface layer?

We absolutely can. But this means that the symbols, tools, and techniques we work with at first will have to look a little different than you might expect, because each will be focused more closely on representing its own particular aspect of musical experience. And they'll also need to change their form along the way, and to be replaced by different symbols, tools, and techniques that gradually begin to connect together and resemble our more familiar ideas about music. In short, we have to be playful and creative, not only with our music, but with our ways of *understanding* music.

Shapes is an example of how to approach musical basics in this way. And there are no doubt as many other possibilities as there are ways to be playful and creative. But since we've landed *here*, I'd like to show you around, and invite you to try out this experience for yourself.

A Brief Tour

I'll begin our tour by showing you the first lesson, which is my favorite way to introduce Shapes:

[Follow This Link](#)¹

¹ Link to: </writing/about#a-brief-tour>