Josiah Wolf Oberholtzer

1816 Madison Street
Floor 2
Ridgewood, NY 11385

Phone: (781) 985-3351
Email: josiah.oberholtzer@gmail.com
GitHub: http://github.com/josiah-wolf-oberholtzer
Web: http://josiahwolfoberholtzer.com

Education

Ph.D. & **M.A.**, Music, Harvard University, 2015

Dissertation: *A computational model of music composition*

Documents low and high-level APIs, techniques and tooling for modeling music notation and symbolic music composition in Python, along with examples of musical works built using these tools.

M.A., Music, Harvard University, 2015

Schloss Solitude Summer Academy, Stuttgart, 2007

B.Mus., Oberlin Conservatory of Music, 2006

Employment

Software Engineering Manager, Paribus / Capital One, 2018-present

- Architected next-generation event-sourced/CQRS system for Paribus' hotel arbitrage product.
- Implemented local integration testing for hybrid servered/serverless systems using Docker-Compose, Localstack, Serverless and Terraform.
- Modernized build pipelines for speed and legibility, wrote shared pipeline libraries, and integrated Jenkins with Slack for better build status visibility.
- Developed workflows for packaging and deploying Serverless applications within CapitalOne's ecosystem.
- Triaged security compliance issues.
- Implemented entity-resolution microservice for matching hotel names and addresses against Priceline's dataset.
- Maintained legacy hotel arbitrage monolith service, added extensive testing, and prepared for switchover to next-generation replacement.
- On-call for service outages throughout the Paribus organization.

Developer, Discogs, 2015-2018

- Refactored and extended test coverage on a large legacy Python 2.7 codebase.
- Prepared the legacy codebase for a potential Python 3 upgrade.
- Developed new features to support the buyer and seller experience, including an improved record collection feature and shipping labels.
- Created and deployed containerized applications to Discogs' Kubernetes cluster.
- On-call for Discogs' central authentication service.
- Instrumented new and existing systems and API integrations.

Research Technical Assistant, MIT Music and Theater Arts Department, 2013-2014

- Implemented API documentation system.
- Refactored and parallelized musical corpus metadata population and search.
- Optimized musical data structures for rapid lookups by timing information.

Teaching Assistant, Harvard University, 2010-2014

- Taught courses at the graduate and undergraduate level in digital signal processing, interactive software for artists, sound reinforcement, acoustics and music theory.
- Led students in installing massively-multi-channel speaker arrays.

Programmer, Forced Exposure, 2006-2008

- Implemented automated documentation preparation workflows for product catalogs and email campaigns.
- Assisted in creation of new B2C mail-order website.

Technical Skills

Languages: Python (primarily), with additional experience in Goovy, Java, Ruby, Javascript

Development Tools: Unix command line environment, git, vim, LaTeX, Jenkins & Travis-CI, Docker & Docker-Compose, Vault & Terraform, Kubernetes & Helm, Serverless Framework, Datadog, Sentry, Kibana, Metabase, Redash

Databases: MySQL & PostgreSQL, MongoDB, DynamoDB, Redis, Memcached

Python-specific Tools: django, flask, aiohttp, boto3, numpy, ply, flake8, mypy, pytest, sphinx, sqlalchemy, virtualenv

Open-Source Software Development (Selected)

Disco/graph, 2015-, "Visualizing music as a social graph"

- Flask, PostgreSQL, Gunicorn and supervisor.d on the back-end.
- Bootstrap, Jquery and D3 on the front-end.
- Music-informatics graph database implemented on top of Postgres.
- In the process of being reimplemented on top of JanusGraph.

Live: http://discograph.mbrsi.org | *Source:* https://github.com/josiah-wolf-oberholtzer/discograph

Abjad, 2009-, "A Python API for Formalized Score Control"

Contributions: multiple ply-based syntax parsers, documentation tools, document processing pipelines

Documentation: http://projectabjad.org | *Source:* https://github.com/Abjad/abjad

Music21, 2013-2014, "A Toolkit for Computer-Aided Musicology"

Documentation: http://web.mit.edu/music21 | *Source*: https://github.com/cuthbertLab/music21

Teaching Experience

CCRMA, Stanford University

Formalized Score Control: Using Python and Abjad in Music Composition, Summers of 2016-2018

A week-long crash course in Bash, Python, command-line typesetting tools and musical algorithms, for all ranges of experience.

https://ccrma.stanford.edu/workshops/abjad-2017

Harvard University

Electroacoustic Seminar, Spring 2014

Teaching Assistant for Aaron Einbond

Introduction to Live Electronics, Spring 2014, Spring 2012, Fall 2011

Teaching Assistant for Aaron Einbond

Why You Hear What You Hear: The Physics of Acoustics, Spring 2013

Teaching Assistant for Eric Heller

Electroacoustic Seminar, Spring 2013

Teaching Assistant for Hans Tutschku

Harmony in Electronic Dance Music, Spring 2013

Teaching Assistant for Olaf Post

Intimate Sound Installations, Fall 2012

Teaching Assistant for Hans Tutschku

Electronic Music and Visual Art, Fall 2011

Teaching Assistant for Hans Tutschku

Intermediate Music Theory for Concentrators, Spring 2011

Teaching Assistant for Olaf Post

Introductory Music Theory for Concentrators, Fall 2010

Teaching Assistant for Olaf Post

Publications, peer-reviewed

(2015) T. Bača, **J. Oberholtzer**, J. Treviño and V. Adán.

Abjad: An Open-source Software System for Formalized Score Control.

Proceedings of TENOR 2015, First International Conference on Technologies for Music Notation and Representation.

Presentations

Virtual Score Construction with the Abjad API for Formalized Score Control

Study Day on Computer Simulation of Musical Creativity, University of Huddersfield, 2015

Abjad: A Python API for Formalized Score Control

Open Space, Internationales Musikinstitut Darmstadt, 2014

Composing at the command line: Symbolic music representation in Python

Boston MusicTechFest, 2014

Abjad: A Python API for Formalized Score Control

University of California at San Diego, 2012

University of California at Santa Barbara, 2012

University of California at Santa Cruz, 2012

Stanford University, 2012

University of California at Berkeley, 2012

SASHA: Saxophone Acoustic Search and Heuristic Analysis

Digital Musicology Workgroup, Harvard University, 2010

Particle Music in Timbral Space

Visiones Sonoras Festival, CMMAS, Morelia, Mexico, 2009

Grants

UCIRA Sorcerer/Alchemy Grant, 2012

Awards

The Harvard University Certificate of Distinction in Teaching, Fall 2014

The John Green Fellowship, 2013

The George Arthur Knight Prize, June 2012

The Harvard University Certificate of Distinction in Teaching, Fall 2013

The Harvard University John Green Fellowship Award, June 2012

The Harvard University Certificate of Distinction in Teaching, Fall 2011

References available upon request
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