

# Harrison Grant Totty

SENIOR DEVOPS ENGINEER · SOFTWARE PROGRAMMER

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## Summary

Current Senior DevOps Engineer within the Production Operations group at Centro. Highly experienced at implementing custom infrastructure solutions within both cloud and on-premises environments. Thrives in seeking solutions within domains not yet encompassed by popular technologies or industry standards.

## Education

### Tallahassee Community College

ASSOCIATE OF SCIENCE

- Graduated honors with 4.0 GPA.

Tallahassee, FL

Jan 2015 - Jan 2016

### University of West Florida

PHYSICS

Pensacola, FL

Aug 2011 - Jul 2014

## Skills

### Amazon Web Services

ALB/ELB, Cloud Formation, EC2, EKS, IAM, Lambda, RDS, Step Functions, Secrets Manager

### CI/CD

Jenkins Pipelines (Declarative & Scripted Syntax)

### Configuration Management & IaC

Ansible, Puppet, Saltstack, Hashicorp Terraform

### Containers & Virtualization

containerd, Docker

### Data Languages

INI, JSON, TOML, XML, YAML

### Data Science

Jupyter Lab/Notebooks, Mathematica, matplotlib, plotly, sympy

### GNU/Linux Distributions

Arch Linux, Debian (Ubuntu), Gentoo, RHEL (CentOS), Void Linux

### High Availability

HAProxy, keepalived

### Kubernetes

Helm, Kubernetes (managed & unmanaged), CRDs & Custom Operators

### Markup Languages

TeX, Markdown, Org

### Networking Fundamentals

ARP, CIDR, Mikrotik RouterOS, Ubiquiti Unify Controller, VLAN

### Programming Languages

C/C++, C# .NET, Emacs Lisp, groovy, Perl, Python, Rust, Shell Languages, Wolfram (Mathematica)

### Python Development

Poetry, PyTest

### Project Management

GitHub Issues/Projects, GitLab Issues, JIRA

### Repository Hosting

Bitbucket, GitHub, GitLab

### Secrets Management

Hashicorp Vault

### Templating Languages

Cheetah, Embedded Ruby, Jinja, Liquid

### Text Editors

GitHub Atom, GNU Emacs, nano, vi/vim, Visual Studio Code

### Version Control Systems

cvs, git

### Web Servers

NGINX, Apache Tomcat

## Work Experience

### Centro, Inc.

SENIOR DEVOPS ENGINEER

Remote

Feb 2021 - Present




- Developed custom operators to simplify deployment of Basis platform environments into Kubernetes.
- Wrote terraform code for managing infrastructure hosted in AWS.
- Implemented serverless data pipelines using AWS Lambda & Step Functions.

### Wolfram Research, Inc.

DEVOPS ENGINEER


Champaign, IL

Apr 2018 - Feb 2021

- Streamlined disaster recovery of Wolfram Cloud user data with end-to-end encrypted backups via  backuputil.
- Provisioned bare-metal Kubernetes environments for Wolfram|Alpha utilizing Kubespray, Helm, Rook-Ceph, and Velero.
- Incorporated Hashicorp Vault for secrets management of Kubernetes CI/CD pipelines.
- Implemented infrastructure as code (IaC) standards for on-premises environments by leveraging  Puppet and  Cobbler.

#### WEB SYSTEMS ADMINISTRATOR

Dec 2016 - Apr 2018

- Developed a  templating engine for Apache HTTP Server configurations.
- Collaborated custom log data analysis and reports for Wolfram Cloud in Python and Mathematica.
- Designed Salt configurations for managing internal infrastructure.
- Developed backend code for the Wolfram Cloud Platform in Java.

#### WEB SYSTEMS INTERN

Sep 2016 - Dec 2016

- Implemented new Wolfram kernel features in C/C++.
- Developed a containerized RPM build environment hosted in Apache Marathon/Mesos.

### Wolfram Research, Inc.

Boston, MA

#### WOLFRAM SUMMER SCHOOL STUDENT

Jun 2016 - Jul 2016

- Invited to Bentley University for three weeks to conduct research on various machine learning analogues.
- Participated in Wikipedia article authoring meetup at MIT.
- Completed final project on feed-forward neural networks using Boolean networks.

### Tallahassee Community College

Tallahassee, FL

#### MATHEMATICS AND TECHNOLOGY TUTOR

May 2016 - Aug 2016

- Provided tutoring in topics such as Ordinary Differential Equations and introductory programming courses.

### Radio Shack

Pensacola, FL

#### SALES ASSOCIATE

Jul 2013 - Mar 2015

- Provided customer service and support for a variety of mobile devices, DIY components, and more.

### University of West Florida

Pensacola, FL

#### STUDENT SSE SYSTEM ADMINISTRATOR

Jan 2014 - Aug 2014

- Provided general systems administration for the faculty of the School of Science and Engineering.

#### RESNET TECHNICIAN

Feb 2012 - Aug 2013

- Supported the technical needs of dorm students.


## Projects

### Web Systems Infrastructure Rearchitecture

Wolfram Research, Inc.

#### A PROJECT TO MODERNIZE ALL ON-PREMESIS USER-FACING INFRASTRUCTURE

Mar 2020 -

- Leveraged Cobbler for systems provisioning and Puppet for configuration management.
- Targeted CentOS 8.2 (up from CentOS 6.8 and 5.5) for new machines, while still integrating with older environments.
- Implemented infrastructure-as-code standards.
- Developed more than  20 Puppet modules, each with a high degree of parameterization.

#### prov

Wolfram Research, Inc.

#### A PYTHON SCRIPT TO MODIFY COBBLER ITEM SPECIFICATIONS IN A TERRAFORM-LIKE DECLARATIVE WAY

Mar 2020 - May 2020

- Leverages Cobbler's XMLRPC API to synchronize YAML-based item specifications.
- Shows Terraform-like client-server differences prior or during application.
- Supports backwards-compatibility with Cobbler servers older than version 3.
- Synchronizes data items (such as profiles and systems) as well as files (such as snippets).

### Personal Finance Analytics Platform

Personal Project

#### A PYTHON LIBRARY FOR CATEGORIZING AND ANALYZING BANK TRANSACTIONS

Mar 2020 -

- Categorizes transactions based on a home-made library of regular expressions.
- Leverages sklearn to perform predictive regression on financial trends.
- Provides a wrapper around plotly for graphical analysis within Jupyter Notebooks.

#### grav

Personal Project

#### A GRAVITATIONAL N-BODY SIMULATION PROGRAM WRITTEN IN RUST

Nov 2019 - Dec 2019

- Leverages an entity-component-systems (ECS) simulation backend.
- Simulation data post-processed via Jupyter notebook.
- Custom 3D vector and physical laws implementation.

### CV & Resume

Personal Project

#### (THIS DOCUMENT)

May 2019 -

- Built from Jinja2-templated LaTeX documents via "tmpl".
- Raw data present in YAML format.



## tmpl

A GENERAL-PURPOSE TEMPLATING SYSTEM

- A general-purpose Jinja2/YAML templating system based on "mkconf" and "mkdot".
- Utilized in the generation of this CV/Resume.
- Supports runtime-loaded Python extensions to the templating system.
- Capable of handling raw Jinja2 content piped directly to STDIN.

*Personal Project*

*May 2019 - Jun 2019*



## backuputil

A PYTHON WRAPPER SCRIPT AROUND THE BORG BACKUP UTILITY.

- Extends and generalizes the functionality of Borg.
- Allows multiple "back-up tasks" to be specified in a single configuration file.
- Used to back-up large volumes of data internally at Wolfram Research.
- Supports sending email reports on script completion or detection of issues.

*Wolfram Research, Inc.*

*Jan 2019 - Apr 2020*



## Remote Execution Framework

AN EASY REMOTE COMMAND EXECUTION UTILITY

- Written in Python3 as a lightweight alternative to frameworks such as Fabric and Ansible.
- Automatically formats output depending on whether a TTY is present.
- Capable of running both arbitrary commands and defined tasks.
- Includes interactive console mode.

*Personal Project*

*Nov 2018 - Apr 2019*



## mkdot

THE HANDY DOTFILE TEMPLATING SYSTEM

- Based on "mkconf" project, but specialized for the generation of dotfiles.

*Personal Project*

*Oct 2018 - Dec 2018*



## mkconf

AN APACHE WEB SERVER CONFIGURATION TEMPLATING ENGINE

- Generates Apache Web Server configurations from Jinja2 templates and YAML configuration files.
- Replaced older in-house utility written in Perl.
- Validates directives after generating configuration files.
- Capable of backing-up previous configurations and reverting changes.

*Wolfram Research, Inc.*

*Aug 2018 - Sep 2018*



## Simplex Universe

AN ABSTRACT N-DIMENSIONAL N-BODY SIMULATION PROGRAM WRITTEN IN C# .NET

- Custom CPU-based 3D rendering engine and graphical library.
- Dynamic C# scripting support
- Abstraction over spacial dimensionality and physical laws.
- Implemented Newtonian gravitational, classical electrostatic, and classical electrodynamical laws.
- Real-time simulation parameter tweaking and simulation object property inspection.
- Support for toroidal, infinite, and perfectly elastic/inelastic boundary conditions.

*Personal Project*

*Aug 2013 - Dec 2014*