

# Harrison Grant Totty

DEVOPS ENGINEER · SOFTWARE PROGRAMMER

1307 West University Ave, Champaign IL 61821

☎ (850) 461-8381 | ✉ harringtontotty@gmail.com | 🏠 harrison.totty.dev | 📺 HarrisonTotty | 🌐 harrisant

## Summary

Current lead DevOps Engineer and systems architect for the Web Systems group at Wolfram Research. High experienced at implementing custom infrastructure solutions within bare-metal/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

<b>CI/CD</b>	Jenkins Pipelines (Declarative & Scripted Syntax)
<b>Cluster Orchestration</b>	Helm, Bare-Metal Kubernetes (k8s & k3s)
<b>Configuration Management</b>	Ansible, Puppet, Salt
<b>Container Runtimes &amp; Virtualization</b>	containerd, Docker
<b>Data Languages</b>	INI, JSON, TOML, XML, YAML
<b>Data Science</b>	Jupyter Lab/Notebooks, Mathematica, matplotlib, plotly, sympy
<b>GNU/Linux Distributions</b>	Arch Linux, Debian (Ubuntu), Gentoo, RHEL (CentOS), Void Linux
<b>High Availability</b>	HAProxy, keepalived
<b>Markup Languages</b>	TeX, Markdown, Org
<b>Networking Fundamentals</b>	ARP, CIDR, Mikrotik RouterOS, Ubiquiti Unify Controller, VLAN
<b>Programming Languages</b>	C/C++, C#, .NET, Emacs Lisp, groovy, Perl, Python, Rust, Shell Languages, Wolfram (Mathematica)
<b>Project Management</b>	GitHub Issues/Projects, GitLab Issues, JIRA
<b>Repository Hosting</b>	Bitbucket, GitHub, GitLab
<b>Secrets Management</b>	Hashicorp Vault
<b>Templating Languages</b>	Cheetah, Embedded Ruby, Jinja, Liquid
<b>Text Editors</b>	GitHub Atom, GNU Emacs, nano, vi/vim, Visual Studio Code
<b>Version Control Systems</b>	cvs, git
<b>Web Servers</b>	NGINX, Apache Tomcat

## Work Experience

### Wolfram Research, Inc.

DEVOPS ENGINEER

Champaign, IL

Apr 2018 - Present

- Architected Kubernetes clusters and supporting deployment pipelines.
- Developed/Implemented configuration management and remote execution frameworks.
- Personally architected software platforms, individual servers, machine clusters, and deployment workflows.
- Provided routine performance and security analysis.

WEB SYSTEMS ADMINISTRATOR

Dec 2016 - Apr 2018

- Provided general systems administration for various Wolfram web products and services.
- Designed & built DEV/TEST environments for Wolfram Cloud.
- Developed backend code for the Wolfram Cloud Platform in Java.

WEB SYSTEMS INTERN

Sep 2016 - Dec 2016

- Developed systems utilities to aid common operations tasks.
- Implemented new Wolfram kernel features in C.
- Ported many internal components to containerized environments.

## Wolfram Research, Inc.

WOLFRAM SUMMER SCHOOL STUDENT

- 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.

Boston, MA

Jun 2016 - Jul 2016

## Tallahassee Community College

MATHEMATICS AND TECHNOLOGY TUTOR

- Provided tutoring and support to students in various mathematics and technology topics.

Tallahassee, FL

May 2016 - Aug 2016

## Radio Shack

SALES ASSOCIATE

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

Pensacola, FL

Jul 2013 - Mar 2015

## University of West Florida

STUDENT SSE SYSTEM ADMINISTRATOR

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

Pensacola, FL

Jan 2014 - Aug 2014

RESNET TECHNICIAN

- Supported the technical needs of dorm students.

Feb 2012 - Aug 2013

# Projects

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## Web Systems Infrastructure Rearchitecture

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

- 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.

Wolfram Research, Inc.

Mar 2020 -

### prov

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

- 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).

Wolfram Research, Inc.

Mar 2020 - May 2020

## Personal Finance Analytics Platform

A PYTHON LIBRARY FOR CATEGORIZING AND ANALYZING BANK TRANSACTIONS

- 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.

Personal Project

Mar 2020 -

### grav

A GRAVITATIONAL N-BODY SIMULATION PROGRAM WRITTEN IN RUST

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

Personal Project

Nov 2019 - Dec 2019

## CV & Resume

(THIS DOCUMENT)

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

Personal Project

May 2019 -

### 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 electrodynamic 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*