

@ hello@ulyssa.email
ulyssa.net
github.com/ulyssa
linkedin.com/in/ulyssa/
Pronouns: she/her/hers

PRESENTATIONS

- An Introduction to AWK
Joyent Technical Discussion 2018
youtu.be/DsFTmGzC-QA

While working on updating and fixing AWK bugs in illumos, I gave this internal presentation on how to use AWK.

- An AWK Love Story
Systems We Love 2016
youtu.be/IfhMUed9RSE

WRITING

- iamb.chat documentation
- illumos manual pages
 - ndp(4P) and ndp(8), which I wrote as part of adding a tool for manipulating the IPv6 neighbors table (see illumos#6324).
 - Portions of tcp(4P), which I rewrote and added to while adding support for pluggable congestion control algorithms to illumos.

EDUCATION

B.S. in Computer Science
Brown University
September 2011 - May 2015

Relevant Courses:

- Compilers
- Operating Systems
- Multiprocessor Synchronization
- Topics on Networking and Distributed Systems
- Computer Systems Security

ULYSSA MELLO

WORK EXPERIENCE

iamb, a terminal-based chat client for Matrix

San Francisco, CA

Open Source Software Development

July 2021 - Present

iamb is a chat client for the Matrix protocol that uses Vim keybindings for editing and window management. It supports many of Matrix's features, such as attachments, replies, reactions, editing, redactions, and Markdown-formatted messages.

I wrote a crate called `modalkit` to provide most of the editing code and UI support, to make it easy for myself and others to write additional Rust programs with Vim-like functionality. Some examples of the features it supports are:

- Operations like yank, delete, paste, join, and changing case and numbers
- Word, line, buffer and screen motions, marks, selecting text objects (e.g. quotes and brackets), and navigating the jumplist and changelist.
- Visual selections, including linewise and blockwise selections
- Macro recording and execution, and repeating the previous edit
- Inserting completions, literals, digraphs, and copying adjacent lines in Insert mode
- Window layout and tab management

Recreating the tab and window layout behaviour from Vim was especially important to recreating the feel of using Vim: many applications don't allow both horizontal and vertical splits, or, when they do, don't support resizing or moving them.

Joyent, Inc. (a subsidiary of Samsung Electronics)

San Francisco, CA

Software Engineer

June 2015 - Sep 2019

As a software engineer at Joyent, I worked on adding new features, increasing the reliability of our products, and taking part in an on-call rotation to assist our operations team when they needed to escalate to the engineering team for debugging issues in production deployments. Some projects that I worked on were:

- Improving the reliability of Moray, our Postgres connection pooling service, by implementing adaptive queue management to minimize the load accumulated during, and ensure quick recovery after, slowdowns brought on by `VACUUMs`.
- Migrating Manatee, our HA Postgres service, from using Postgres 9.2 to Postgres 9.5, while ensuring that we had an easy path to later move to Postgres 10.
- Adding support for TCP CUBIC in illumos, by finishing the work another community member had started several years earlier to port the FreeBSD congestion control framework to illumos (see illumos#11553 and illumos#12582).
- Adding support for configuring congestion control on a per-zone and per-connection basis through `ipadm(8)` and the `TCP_CONGESTION` socket option respectively (see illumos#11554 and OS-7427).
- Implementing port ranges, rule priorities, and IPv6 support in Triton's Cloud Firewall, and fixed multiple performance issues that rules caused when new instances were created, updated or deleted.

Computer Science Dept. at Brown University

Providence, RI

Head Teaching Assistant

Fall 2013 - Spring 2015

I worked as a Head TA for three courses while I was an undergraduate student. The first time, I was the Head TA for an introductory Computer Science class taught using the Racket and OCaml programming languages. I loved helping students with no programming experience come to understand the magic behind the computers they use in their daily life, and found it a lot of fun to introduce students used to object-oriented programming to a functional programming paradigm.

I later worked as a Head TA for the Computer Networking course, and the Distributed Computer Systems course. One of the fun challenges of working on computer systems is trying to hold large amounts of distributed state in one's head, and it was rewarding to help others come to appreciate complex systems. I have found much of the experience I gained working with students valuable later on when I became a Software Engineer: many of the same skills apply to helping others with debugging and performing code review.

PROGRAMMING LANGUAGES

- Rust
- C
- JavaScript / node.js
- Go
- Python
- Scala
- Java

OPERATING SYSTEMS

- Linux (15+ years)
- illumos (5 years)

VERSION CONTROL SYSTEMS

- Git
- Mercurial
- Subversion

OTHER TECHNOLOGY

- AWK
- Bash
- DTrace
- ZFS
- Postgres
- XSLT
- HTML / CSS
- L^AT_EX

Computer Science Dept. at Brown University

Systems Programmer, Operator and Consultant (SPOC) Spring 2012 - Spring 2015
While a student, I worked for the Computer Science Department's Technical Staff as a junior systems administrator. I covered the evening hours, and would take care of responding to service outages (e.g. network, filesystem, mail and LDAP), improving and upgrading our infrastructure, and handling support tickets submitted by professors, graduate students and TAs in the evening. Working in this role helped me come to appreciate the complexity of large deployments, and understand how to write and debug software for Linux.

Brown PLT Group

Undergraduate Research Assistant

In the summer of 2014, I implemented a bidirectional type checker for the Pyret programming language based on the Local Type Inference paper by Benjamin C. Pierce and David N. Turner. It was a wonderful experience that helped me come to understand one of the most popular techniques for implementing type inference.

Computer Science Dept. at Brown University

Teaching Assistant

While studying for my Computer Science degree, I worked as a Teaching Assistant for four different courses. Two of them were intro courses, one for majors and one for non-majors. In the class for majors, we taught students about data structures and algorithms using Java and Scala, while the course for non-majors concentrated on lectures on the history of computing and practical labs to learn HTML, Excel, and Access.

I also worked as a TA for the Programming Languages course, which taught students the principles of modern programming languages through implementing interpreters, and as the TA for a course that taught students program verification using tools like the Alloy Analyzer.

PROJECTS

SmartOS anti-spoofing protection improvements:

In SmartOS, guest containers and virtual machines are assigned a virtual NIC with anti-spoofing protections enabled to prevent instances from forging packets with MAC and IP addresses that they weren't explicitly assigned. I added the following to the kernel:

- Support for automatically permitting SLAAC addresses by detecting the Prefix Information header in IPv6 Router Advertisements (see OS-4667).
- Support for using both dynamically- and statically-assigned addresses while anti-spoofing protections are enabled (see OS-4683). Before this was added, admins had to disable the protections entirely to work around the issue.
- Support for configuring environments where guests used unknown DHCP client identifiers (see OS-5195).

illumos guides redesign:

I updated the illumos online guides to DocBook 5, redesigned the site, added printable PDFs, and wrote XSLT scripts for generating indexes on the websites (see illumos/illumos-docbooks#81.) You can see examples of the work I did in the DTrace Guide and the Modular Debugger Guide.

LEADERSHIP EXPERIENCE

President of the Brown Linux User's Group (BLUG)

(2012-2014)

As the president of the Brown Linux User's Group, I was responsible for leading our weekly meetings, arranging group presentations, and organizing our semesterly Installfest, where we helped both students and other community members at the university with figuring out how to install and run Linux on their hardware. I also handled all interactions with the Brown Student Activities Office for taking care of event space and making an appearance at the Activities Fair at the beginning of every Fall semester.

Scouts BSA, Eagle Scout

(2006-2011)

While in the Scouts BSA program, I served as Senior Patrol Leader of a troop of approximately 40 scouts, which involved organizing campouts, and taking care of troop problems and conflicts.

As part of the requirements for earning Eagle Scout, I organized installing a flag pole and repairing and improving the grounds of a local church. This helped me learn how to plan and run a fundraiser dinner, manage a budget to acquire parts and supplies, and oversee a team of volunteers from my troop and the church who helped with installing the pole.

I value the time I spent in Scouts, and learned a lot about how to lead and work with others. Scouts also gave me a life-long love of the outdoors, hiking and backpacking.