

Skills

Training/Mentoring/Teaching

Confidence: 90%

I enjoy working in a team setting, and I also enjoy communicating with both technical and non-technical audiences. For example, I have:

- Walked through Proof of Concept software with potential clients
- Addressed parents' questions and concerns for a summer programming class
- Trained co-workers on how to scrape information using NLP
- Mentored interns one-on-one and helped them feel welcome in the workplace
- Presented dozens of lectures to 100+ students in a 2-story lecture hall

Statistics/Classifiers

Confidence: 80%

I studied CTMC's for my master's research, and my work at Kingland has encouraged me to learn Naive Bayes classifiers to the point where I can teach it.

- I have implemented a custom Naive Bayes Classifier from scratch that used log-normally distributed, historical trend data
- I have implemented, and I understand the math behind Continuous Time Markov Chains
- For small models, one can directly solve the steady state
- For models too large for memory, I can simulate paths in the model
- For more complicated queries, I have experience using the probabilistic model checker, PRISM

Machine Learning

Confidence: 60%

Through classes and my work at Kingland, I have an awareness of many Machine Learning methods and confidence in a few detailed below. I also understand the math behind neural networks (e.g. the chain rule).

- I have implemented a recurrent neural network using Keras/ Tensorflow
- I have read, and I understand academic literature on NLP techniques like word2vec/doc2vec
- I have written algorithms to train Naive-Bayes classifiers and derived the most relevant terms using a term-frequency/inverse-window-frequency metric

Natural Language Processing

Confidence: 70%

I have done a lot of work with the open source NLP library spaCy.

- I've used syntax parse trees to scrape information from data filed with the Securities and Exchange Commission
- I've created several heuristics for tying named entities to entities in a structured, relational database
- I've investigated using other machine learning techniques for classifying sentences/windows of text

Bioinformatics/Dynamic Prog.

Confidence: 80%

I have implemented algorithms using Suffix Trees, Tries, maximal cliques and the Longest Common Subsequence problem for general text processing with Kingland Systems. My master's work in DNA nanotechnology introduced me to many of these algorithms.

Design Patterns/Architecture

Confidence: 80%

I love learning about and applying design patterns for both statically and dynamically typed languages. My favorite books are:

- *Head First Design Patterns* by Bates, Sierra, Freeman and Robson
- *Game Programming Patterns* by Nystrom

My favorite pattern is the composite pattern. One can implicitly use it with maps/dicts, and a surprising number of things work better as trees (e.g. scene-graphs, game entities and ETL processes).

RDBS Design

Confidence: 60%

I have designed two relational schemas, one for a volunteer project and one for Kingland. I have learned about 1st/2nd/3rd and Boyce-Codd Normal Form, and I am confident I can design sensible schemas with referential integrity.

Contact Me

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Technical Writing/Publishing

Confidence: 60%

For both my bachelor's and master's degrees I wrote a 70 page thesis. I have also authored one conference paper and co-authored another. I have received compliments for my documentation at work (though that's proprietary ;P). Bibliography:

- Nakayama, Brian. *Modeling Technologies and Methods for DNA Origami*. Diss. Iowa State University, 2016.
- Thein Than Tun, Robyn Lutz, Brian Nakayama, Yijun Yu, Divita Mathur and Bashar Nuseibeh. "The role of environmental assumptions in failures of DNA nanosystems," COUFLESS 2015, Florence, Italy. ACM, 2015.
- Nakayama, Brian and Bahr, David, "Universal Computation in the Prisoner's Dilemma Game," UCNC 2014, London, Ontario. Springer: Lecture Notes in Computer Science, 2014.
- Nakayama, Brian. *Universal Computation in the Prisoner's Dilemma Game*. Diss. Regis University, 2013.

Languages/Tools

Java

Confidence: 90%

I started teaching myself Java in 2006 before my junior year in highschool. I have since taught others how to program in Java as an instructor for two sections of an undergraduate course titled "Introduction to Object Oriented Programming" (COMS 227), and as an instructor for three sections of a highschool summer course titled "Computer Science: Program Your Own Game." While at Kingland, I use Java ~25% of the time.

Python

Confidence: 80%

I first used Python to create plugins for DNA Origami CAD software. At Kingland, Python is the primary language I use, and I prefer it for its conciseness and my productivity. However, for speed and traceability, statically typed languages (such as Java) often make more sense. I've worked with the following libraries/APIs:

- **spaCy**: Natural Language Processing
- **numpy**: Linear Algebra
- **sciPy**: Statistics and ML
- **flask/gunicorn**: REST Framework
- **cython**: C-Extensions for CPython
- **boto3**: AWS API

PostgreSQL/Flyway

Confidence: 60%

- I have installed, setup and used Postgres for RDBS.
- I use `psql` to manually run queries and `pgpsql` to create server side functions.
- I have used `explain/analyze` commands to find missing indices.
- I have set up cron jobs to vacuum the database to increase efficiency.
- I have installed and used Flyway to incrementally design schemas.

Linux/Bash/Shell

Confidence: 60%

Whenever I don't know how to use a command, I think *man*, if only there was a way to look up what it does? Needless to say, I know just enough to be snarky, but not enough to not use Google! Usually I can get by using a `.bashrc` file to predefine those pesky PATHs and other commands I have a tough time remembering. I also enjoy Vim, though I have successfully avoided Emacs for quite some time.

AWS/Cloud/Terraform

Confidence: 60%

Amazon Web Services consists of over 90 services. Of those services, I have used the following:

- Web Console
- Elastic Cloud Compute (EC2) instances
- EC2 Container Service/Repo (ECS/ECR)
- Elastic File System (EFS)
- Elastic Search (Not AWS specific)
- Elastic/Application Load Balancers (ELB/ALB)
- Terraform/Infrastructure as Code
- Jenkins/Continuous Deployments

I have also tinkered or helped with the following:

- IAM policies
- Ansible
- DynamoDB
- API Gateway

Please contact me if you have specific questions about my AWS experience.



Containers/Docker

Confidence: 50%

I have made and deployed docker containers on AWS ECS clusters. I have created custom containers for Postgres, Airflow, and Python based Natural Language Processing services using a *Dockerfile*. I have also created custom build contexts by using a script to generate `~/.dockerignore/` files. Though I still have much to learn in this area, I recognize its power, and I believe this will continue to be important in the future. (I would like to learn more about Container Orchestration Engines in the future.)

Git/Version Control

Confidence: 70%

- I wrote the best practices for Git for the benefit of our interns and our team at Kingland.
- While I would not consider myself an expert, I know enough to manipulate (merge/rebase/checkout) local and remote branches.
- I once diagnosed and fixed a rewrite of our remote git repository committed by an intern using *git push -force*.

L^AT_EX/SVG

Confidence: 60%

L^AT_EX is a scripting language that one can use to create beautiful and interactive PDFs. If I needed to make an important presentation, or if I wanted to write a patent, I would use L^AT_EX to do this. I wrote many homework assignments, most of my lectures and all of my published papers using L^AT_EX. I also use Standard Vector Graphics for hand coded images.

Javascript/JQuery

Confidence: 70%

When I first learned Javascript, back in 2006, people still had to worry about making their web pages compatible with Netscape, flash was still a thing, and people used "Dynamic HTML" to update the Document Object Model. As a language, Javascript has a lot of similarities with Python, despite all the curly braces. I made most of the animations on my personal webpage using Javascript to manipulate the DOM of SVG elements, with some help from JQuery where possible to help with transitions and selecting elements.

CSS/SASS

Confidence: 50%

I do not have encyclopedic knowledge of all of the properties one can manipulate with CSS, but I do at least understand the difference between margins and padding. This website shows what I can do with CSS, including some custom, tailored, responsive design.

C/C++/Other Lang.s

Confidence: 40%

Mostly to see what all the hype was about, I used C++ to write:

- A program for approximating the surface area of protein molecules that implements a deterministic algorithm for evenly distributing points on a sphere
 - A global sequence alignment algorithm for matching approximately similar pieces of DNA (or any type of string)
- I've also dabbled in other languages:
- I've used C with the Java Native Interface to write a proof of concept code for rendering a cube using only integer arithmetic
 - I've used both Verilog and VHDL to program Field Programmable Gate Arrays
 - I also have a fair amount of experience reading and debugging MIPS assembly, and some experience with AVR

Work History

Kingland Systems

Software Engineer

1/2016 - Now

A small-medium sized company that specializes in creating software solutions to help large companies comply with regulations mostly in the financial industry. Notable accomplishments include:

- Creating proof-of-concept code and demoing for clients, who eventually signed a large, multi-year contract
- Implementing Natural Language Processing and Bioinformatics algorithms to scrape information from unstructured data
- Creating a Docker Container that mounts an AWS EFS drive that runs as a service in AWS ECS
- Deployed microservice accessed via ELBs on AWS ECS using Terraform
- Interviewing and mentoring interns, and presenting on behalf of Kingland on campus and at recruiting events

ISU CS Department

Instructor

5/2015 - 6/2015, 1/2017 - 5/2017

For the Computer Science Department at ISU I taught two sections of Introduction to Object Oriented Programming, one during the summer of 2015 (30 students), and one during the fall of 2017 (150 students) while also working at Kingland. Go to www.noyama-dev.com/resume/ to view an example lecture, students reviews and example homeworks.

ISU CS Department

Research Assistant

6/2013 - 8/2013, 5/2014 - 6/2014, 8/2014 - 4/2015

As a research assistant at Iowa State University, I worked on how to apply concepts from Computer Science and Graph theory to model a method for creating nano-scale machines called DNA Origami. I received some publications and gave some presentations on my work.

Papers/Presentations

- Nakayama, Brian. *Modeling Technologies and Methods for DNA Origami*. Diss. Iowa State University, 2016.
- Thein Than Tun, Robyn Lutz, Brian Nakayama, Yijun Yu, Divita Mathur and Bashar Nuseibeh. "The role of environmental assumptions in failures of DNA nanosystems," COUFLESS 2015, Florence, Italy. ACM, 2015.
- "Universal Computation in the Prisoner's Dilemma Game," UCNC 2014, London, Ontario. Springer: Lecture Notes in Computer Science, 2014.
- "DNA Nanotechnology: The Programmable Building Block of Life," Computer Seminar Series. Simpson College: Simpson, IA.

ISU CS Department

Teaching Assistant

9/2013 - 4/2014, 8/2015 - 12/2015

As a teaching assistant I graded, helped students and gave lectures for the following classes:

- COMS 321: Computer Architectures
- COMS 409/509: Computer Architectures

Table 2 Table

Volunteer Android Dev.

2/2015 - 4/2016

While attending graduate school, I volunteered to make an Android application for a food rescue organization called Table to Table. Through this I learned a bit about Android development, and I also managed and advised an undergraduate whom we hired to also work on the app. During this opportunity, I worked closely with Professor Shweta Chopra.



Contact Me

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Education

Iowa State University

Ames, IA

Master's Comp Sci

GPA: 3.89, 6/2013 - 1/2016

I became a better inventor, researcher and teacher at ISU. (See my online resume for an unofficial transcript.)

Honors/Activities

- Robert Stewart Early Research Award
- Teaching Excellence Award
- Pragmatics Fellowship
- Graduate Academic Committee Member
- Graduate and Professional Student Senator
- Computational Thinking Competition Volunteer/Judge
- Youth and Shelter Services GRIP Mentor

Regis University

Denver, CO

Bachelor's in Comp Sci, Math

Minor in Women's Studies

GPA: 3.96, 8/2009 - 5/2013

I found my love for Computer Science and Social Justice at Regis. (See my online resume for an unofficial transcript.)

Honors/Activities

- Diversity Award
- Math-Science Scholarship
- Frederick T. Daly S.J. Award for Excellence in Mathematics
- Alan M. Turing Award for Excellence in Computer Science
- Honors Program
- Multicultural Awareness Committee
- President of Gay Straight Alliance
- Volunteer at Comfort Café

Korea University

Seoul, South Korea

Study Abroad

2/2012 - 6/2012

I learned a lot about myself in Korea, and I picked up some Korean: 저는 브라연 노야마예요. 만나서 반가워요!

Highlights from Seoul

- I met many Korean people, as well as folks from Turkey, the EU, Japan, China, and all over the USA
- I met my partner, whom I recently married, in Seoul
- I learned about how my upbringing in the USA affects how I interact with others in the wider world.
- The immense respect for education in Korea inspired me to go to graduate school