

# Kristian Mischke

Lead Data Scientist - Generative AI

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Polymath who enjoys grokking large and complex systems. Over six years of professional experience in Software Engineering with an initial focus on Video Game development, followed by full-stack web app engineering, and now in building cloud solutions with Generative AI. Always looking to surround myself with people I can learn from. I have a passion for sustainability and building ethical systems that help humanity.

## Experience

### Lead Data Scientist - Generative AI

[Booz Allen Hamilton Inc.](#)

October 2023–Present

Remote-Hybrid | MD | Washington, D.C.

- Championed migration of [Azure](#) data ingestion pipeline to [AWS](#) including switching from [Azure AI Video Indexer](#) , [Document Intelligence](#) , and [Azure AI Search](#) to [Amazon Transcribe](#) , [Amazon Textract](#) , and [OpenSearch Serverless](#) respectively.
- One of the primary contributors to a multi-cloud (Azure & AWS), multi-language GenAI platform ( [Java Spring Boot](#) Web App & [Python](#) data ingestion pipeline) serving 200+ active Alpha users while pursuing ATO (Authority To Operate) in production environment for thousands of users.
- Developed novel [RAG](#) approach for interleaving generated content with reliable citation blurbs using prompt-engineering and Levenshtein edit operations.
- Solved data processing approach for government RFP (Request for Proposal) documents using [Azure Functions](#) and prompt-engineering OpenAI models with structured outputs to extract and classify sections of the document.
- Maintained company internal newsletter broadcast to hundreds of employees for latest GenAI advancements and research.

### Associate Software Engineer

[Ronday Technologies LLC](#)

August 2021–July 2023

Remote

- Adapted quickly to changing requirements and priorities, demonstrating flexibility and a growth mindset in a dynamic startup environment.
- Conducted thorough code reviews and provided constructive feedback to peers, fostering a culture of collective learning and high-quality code standards.
- Pursued R&D in [Generative AI](#) and within a week, rapidly developed a [GPT-4](#) prompt 3D sandbox world demo.
- Reduced time to add new backend object types from days to minutes by implementing a generic object data structure stored in [Postgres](#) and validated by JSON schemas, streamlining the development process.
- Integrated [Mixpanel](#) analytics for data-driven decision-making, enabling the team to make informed decisions and improve overall application performance.
- Successfully integrated [Unity WebGL](#) building, automated asset exporting, and hosting addressable assets on AWS, improving time to enter platform providing the user with a seamless experience.
- Managed Dev-Ops build pipeline with [Concourse](#) , ensuring a unified build process for optimal simplicity and efficiency.
- Demonstrated a deep understanding of end-to-end networking stacks, contributed to distributed realtime backend architecture powered by [SignalR](#) , [Redis](#) , and [Postgres](#) .
- Doubled the number of users capable of being in a space at a given time, by unifying the network paradigm.

### Data Science Research Intern

[RedShred LLC](#)

March 2021–July 2021

Catonsville, MD

- Fine-tuned [RoBERTa](#) for classifying emails with .909 median f1-score, which outperformed the 0.78 of the prior models.
- Annotated naval document dataset with [Label Studio](#) to train task-specific models for segmenting documents and extracting key actors and events with [NER extraction](#).
- Highlighted key connections found in naval reports displaying actors, weather events, and locations in a custom interactive dashboard made with [streamlit](#)
- Used [MLFlow](#) to manage experiments and track metrics during model training which improved collaboration with team members.

### Junior Programmer

[Mohawk Games LLC](#)

Jan 2018–July 2021

Linthicum, MD

- Integrated [mod.io API](#) into [Old World](#); added support for modding with AssetBundles and for Translation mods.
- Assessed capability of [GANs \(Generative Adversarial Networks\)](#) through R&D for generating in-game character portraits.

- Developed a Text Manager class integrating Mohawk's localization system with hierarchical text generation
- Implemented the in-game "Event Browser" tool in [Old World](#) that allows designers and writers to easily modify and create XML files for in-game events.
- Wrote a [Unity](#) tool that allows developers to observe the dependency relations of Unity assets.

## Education

### University of Maryland, Baltimore County

**May 2021**

Bachelor of Science, Computer Science (Game Development Track) Minor in Applied Linguistics

3.942 GPA Outstanding Senior in Computer Science

### Continued Learning

**Secure Code Warrior: In-depth OWASP Top 10 Awareness**

**2022**

[CD.Training: TDD & BDD - Design Through Testing](#)

**2023**

## Projects

### Recurring Moment

Spring 2021

- Conceptualized, Pitched, and Prototyped original idea during the first 3 weeks of class.
- Acted as Lead Designer and interfaced with the Art & Programming teams at weekly meetings.
- Project management with **SCRUM** development sprints and burndown charts
- Implemented core mechanics and sparse data structures to store time-travel data.

### GroupFormer

Spring 2021

- **AGILE** and **GitFlow** frameworks for development sprints
- Developed front-end form for setting up the GroupFormer project using **Django**, **HTML**, and **JQuery**.
- Collaborated with teammates to develop algorithm for scoring participant groupings.
- Integrated Django authentication to secure instructor's forms.

### Data with a K

2022-Present

#### Devs with a K LLC

- Ideated data abstraction layer to handle different kinds of data.
- Architected data pipelining suite in **Python** backed by **Cassandra** and **Redis**.
- Developed receipt processing API that stitches multiple receipt images together using **OCR** to extract receipt items and costs.
- Accelerated knowledge of using **Docker** with Nvidia GPUs and AMD RoCM APUs for **Machine Learning** applications.
- Implemented security standards with password rotation using **Vault** and authentication with **Auth0** JWTs

### "Magic Random Gathering"

2019-Present

- Developed AI magic card generators combining text and image **Generative AI**.
- Created modified **BNF** grammar for card generation until switching to **GPT-3** when it was released.
- Card art generation with **VQGAN+CLIP** and later **Stable Diffusion** and **Midjourney**
- Printed hundreds of cards & played dozens of games, including at a local game store!

### Applying the Cascaded Finite State Grammar Induction Model to Trading Card Game Corpora

Fall 2020

#### CMSC 473 Intro to NLP Class @ UMBC

- Proposed the original idea for [this final group project](#).
- Implemented-with a group of 3 peers-a **Grammar Induction** algorithm in **Python** from an academic paper that uses a cascaded chunking algorithm with **HMMs**.
- We analyzed model performance using perplexity, and we applied it to Trading Card Games like *Magic: the Gathering*, *Yu-Gi-Oh!* and others.

### Linux Chess Kernel Modules

Spring 2020

#### CMSC 421 Operating Systems class @ UMBC

- Implemented a device module in **C** to store and manage chess game states across multiple file pointers; with the option to play against an AI opponent using the min-max with alpha-beta pruning algorithm.
- Only student out of the three sections of the course to complete all the extra credit and be eligible for the course-wide tournament.

## Volunteer Work & Clubs

### Volunteer Tutor

2014-2021

#### Crossroads Homeschool CO-OP

Baltimore, MD

- Managed classes containing about a dozen Middle- or High-School students
- Developed HS Programming curriculum based off the book [Learning Processing](#) by Daniel Shiffman.
- Taught students about variables, program flow, and basic problem-solving using [Scratch](#) by MIT.
- Integrated my [YouTube video tutorials](#) for individualized instruction for the 2018-2020 School Years.
- Utilized the [CodeHS](#) online curriculum for managing and tracking student assignments for a HS Web Design class.