

YANALL BOUTROS

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Yanall-Boutros.github.io

Baltimore, MD

EDUCATION

University of California, Santa Cruz [UCSC]

September 2016 - August 2020

Bachelor of Science (B.Sc.) Physics, B.Sc. Computer Science

Santa Cruz, CA

- Electives: Advanced Programming, AI, Computational Physics; Department GPA: 3.40/4.00

TECHNICAL STRENGTHS

Languages: Python, C/C++, C#, Bash, Powershell, Tex, HTML, NodeJS, Haskell, Perl

Frameworks: TensorFlow, PyTorch, Scikit-HEP, Bootstrap, JQuery, Numpy, Matplotlib, Pandas

Infrastructure: GNU/Linux, Unix, Windows, PostgreSQL, Kafka, Docker, Git, Jira, Trello

Mathematics: Scientific Communication, Modeling, Statistics, Artificial Intelligence, Simulations

Data Science: Machine Learning, Data Analysis, Data Validation, Research, Testing, Debugging

InfoSec: Metasploit, Burp Suite, OWASP Zap, Nmap, Shodan, Maltego, Snyk, Wireshark

EXPERIENCE

DCS Corp

October 2021 - Present

Software Engineer

Aberdeen, MD

- Supported Army Research Lab Human Research and Engineering Directorate
- Integrated Computer Vision [CV] algorithm to segment and classify instances in video feed
- Automated data generation for CV classifier by rendering post-processed scenes in Unreal Engine
- Automated detection, mask creation, and augmentation of new target classes to retrain CV model
- Generated plots detailing model performance as function of distance, orientation, terrain
- Orchestrated deployment of docker containers with unit file templates and systemd services
- Made Automatic Speech Recognition [ASR] and Natural Language Processing [NLP] pipeline
- Made Kaldi Vosk and Whisper Speech-To-Text [STT] tool with supervised auto-corrections
- Made tool to accelerate corrections to update large language model [LLM] and lexicon
- Made information retrieval algorithm extract survey answers from transcriptions using word embeddings
- Integrated STT, NLP, and Benchmarking tools in Bootstrap Express NodeJS, Dockerized services
- Made TensorFlow EEG Net binary classifier 70% accurate in associating physio data with firing events
- Integrated Kafka/PostgreSQL Producer/Consumer in Component Health System, ASR/NLP/CV tools

Bitwork Solutions

April 2023 - Present

Partner

Remote - Baltimore, MD

- Integrating APIs to automate generating articles of keywords for target industry and audience
- Made tool to scrape any URL and categorize which business categories are most similar
- Mentored Junior AI Engineer on LLM for physics
- Implemented information retrieval algorithms to determine competitor keywords
- Implemented text generation algorithms to mass-schedule Search Engine Optimized posts
- Assign tasks to subcontractors with Jira, Trello. Review deliverables
- Designed SQL Data Schemas for interface, managed user group / role permissions
- Wrote flask middleware for accessing database and automating database model ORMs

- Consult feasibility of AI integration and modern data science techniques to project goals
- Consult on server architecture, microservice architecture

Digital Asset Management Group

Manager

March 2022 - August 2022

Remote - Baltimore, MD

- Streamlined conversion from artists rendition to video game asset
- Implemented Neural Radial Fields and ZeroShot. Made transforms matrix from 2D drawings
- Setup dedicated local Jax/Dalle/Imagegen server, researched Text → 2D → 3D generation

Independent Contractor

Independent Contractor, Software Engineer

October 2021 - March 2022

Baltimore MD

- Made order queue for client interface in a web application for Full Send Network [FSN]
- Made web queue database in PostgreSQL and NodeJS
- Made Decentralized Exchange Volume Liquidity trade bot for FSN
- Made accelerated mask creation tool with click carving ResNext FPN AI application for FSN
- Setup server with 10x1080TI GPUs to bruteforce recover a private key for client
- Determined computational feasibility from combinatorics and recovered client information
- Setup local home security system and review dashboard for client

Independent Contractor

Open Source Investigator

September 2022 - Present

Remote - Baltimore, MD

- Found missing person's full name, social media, and contact information given only an online username
- Found locations, owned organizations, social networks, and private information on behalf of tenant
- Recorded incriminating evidence in domestic violence case
- Frequent fraud checks for clients on solicitors

Santa Cruz Institute for Particle Physics [SCIPP]

Undergraduate Research Assistant Intern

August 2018 - August 2020

Santa Cruz, CA

- Attended meetings with scientists from SCIPP and CERN
- Simulated interactions in the Large Hadron Collider. Trained neural networks in TensorFlow
- Streamlined, benchmarked, and dockerized Python workflow and modules for simulating particle physics
- Achieved 80% accuracy, 5% bias in Confusion Matrix in classification of parent particles
- Taught new research assistants how to use the framework, docker, and python
- Made histograms to identify expected values for Higgs boson

UCSC

Teachers Assistant

March 2019 - June 2019

Santa Cruz, CA

- TA for Physics Class on Pressure, Buoyancy, basic fluid mechanics
- Graded Papers, Reviewed common mistakes, reported and updated quiz curriculum

UCSC, Learning Support Services [LSS]

Tutor

August 2018 - August 2020

Santa Cruz, CA

- Taught Introduction to Data Structures, Electromagnetism, Mechanics, and Thermodynamics
- Mentored in individual and group settings

Private Tutor

Self Employed

August 2018 - August 2020

Santa Cruz, CA

- Taught Precalculus, Physics, and Piano

- Assigned learning targets, supervised children

PROJECTS

Rocket League Visualization

December 2022 - Present

- Bought Unreal Engine 5 Rocket League Remake assets, rendered custom shapes and visualizations
- Uses differential geometry to calculate set of all possible intersection points
- Intersection points do not depend on initial impulse, allowing predictions to be made before impulse
- Draws parabolas with increasing conal radiuses to predict possible ball locations after an initial impulse
- Visualizes positioning as map of play positions, velocities, and momentum centered around ball

Text To Speech [TTS] Voice Cloning

April 2023 - July 2023

- Conducted literature review on Tortoise TTS to further study architecture of modern AI networks
- Researched Vector Quantized Variational Auto Encoders [VQ-VAE], Autoregressive Decoders, Contrastive Language-Voice Pretrained Transformer [CLVP], Denoising Diffusion Probability Models [DDPM], Tokenizers, and Vocoders
- Setup bash pipeline to preprocess audio files to clone voices

Botler - Personal Discord Bot

February 2023 - Present

- Made discord bot to play audio files over discord
- Setup AWS server, then self hosted botler instance
- Integrating Text Generation and TTS AI services

IP Camera Hacking

November 2022 - December 2022

- Assisted in anonymous operation to monitor war crimes in Russian occupied Ukraine, to report to International Criminal Court
- Used shodan to determine what type of a device an ip address was in Russian occupied Ukraine
- Generated list of