Adam Gradzki

Email: hi@adamgradzki.com
Tel: 301-785-1297
Residence: Bethesda, Maryland, USA
Work Authorization: US Citizen
Latest resume updates: **adamgradzki.com/resumes**

SUMMARY

Adam Gradzki is a **software engineer** with experience in financial and computer vision model deployment in the cloud. His work leverages **custom software development** to automate business processes in the cloud to bring business value to finance teams, business analysts, and serve machine learning models to customers.

Highlights (chronological):

- Reduced **model training cost** and **faster model testing** with a custom hybrid cloud topology, a blend of on-premises and AWS servers, for model training.
- Led a team to develop and deploy a **self-service dashboard for radiology** chest x-ray and biopsy pathology slide classification system in the cloud.
- **Implemented and deployed** to production externally audited & essential regulatory consumer credit risk management **loss forecasting models**: IFRS9 and CECL.

Adam graduated from the United States Army Intelligence Center of Excellence (USAICoE), the United States Army's school for professional training of military intelligence personnel. Here Adam learned to combine information from a vast collection of real-time feeds, including analyzed images, terrestrial sensor networks, and intercepted communications to assemble a comprehensive battlefield status report for senior leadership.

After leaving the Army Adam worked for the University of Pittsburgh Drug Discovery Institute to link clinical trial outcomes with performance of Lab-on-a-Chip (LOC) devices which allow for testing the effects of drugs in human organs without requiring human involvement. Adam led a team of 4 developers at SemanticMD to develop cloud computer vision dashboards (HTML and REST APIs) for chest x-ray and pathology slide self-service image upload, parsing, and viewing of arcane high resolution medical image formats such as DICOM and SVS for detection of tell-tale disease signatures within each image. After leaving SemanticMD Adam worked in a team of 5-15 developers and business analysts to implement international loss forecasting models into production at Capital One Financial Corporation.

Adam is authorized to work in the US for any employer.

SKILLS

- **Linux:** 9 years of professional experience building Linux systems including Arch Linux (primary OS), Ubuntu, Debian, CentOS, and Amazon Linux AMIs on EC2.

- **Data Acquisition, Data Refinement, Qualification Requirement Specification, Software Architecture:** Worked with business analysts and finance teams to deploy new business intent in a rapid and flexible manner.
- **Software Testing:** Introduced Jenkins CI/CD with pytest integration and tests for production software and machine learning model deployment.
- **Big Data and Distributed Systems:** Wrote code to distribute image processing spanning multiple servers on the cloud.
- **Python:** 9 years of professional experience. Experienced in optimized numerical routines, low-level web APIs, high-level numerical APIs such as Pandas and NumPy, cloud VM/container deployments.
- **Golang**: Less than one year of professional experience on hobby projects.
- **Rust**: Less than one year of professional experience on hobby projects.
- **Javascript (vanilla):** 4 years of professional experience. Developed dimensionality reduction techniques for 2D and 3D visualization of input data clusters to allow users to easily see hidden relationships within the data using Three.js with WebGL and native pixel coordinate based DOM manipulation.

TOOLS AND SKILLS

Python, Pandas, Golang, Rust, QEMU, SSH, Vim, PyCharm, DataGrip, WebStorm, NumPy, Numba, SQL, Arch Linux, Ubuntu Linux, CentOS, AWS, Amazon Linux, EC2, RDS, Route53, Keras, Tensorflow, NumPy, SciPy, scikit-learn, scikit-image, Cython, OpenCV 3, Redis for caching, Pandas, Django, Mailgun, Flask, IPython, Jupyter, gunicorn, uwsgi, pytest, requests, toolz, psycopg2, asyncpg, asyncio, systemd, supervisord, zsh, bash, sh, matplotlib, VTK, Point Cloud Library (PCL), OpenSlide, Beautiful Soup 4, lxml, KVM VPS management, VirtualBox, VMware Workstation, VMware Fusion.

EXPERIENCE

Organization: **Swift Pace Solutions**
Client Site: **Capital One**
Role: **Python Software Developer, Data Engineering**
Dates: February 2019 - April 2020
References and Point of Contact: Ghan Shyam Singh, tel. 480-277-7974
References and Point of Contact: Roshan Poojari, tel. 571-424-0753
Tasks, Goals, and Accomplishments:

- **Automated loss forecasting model execution** processes resulting in a reduction in analyst labor in setting up experiments. Obtained a one order of magnitude time improvement. Exploration of different economic scenarios became possible when model execution, modification of underlying model assumptions, and the ability to share a reproducible run with other analysts needed only one hour from a cold start to get started instead of one week per analyst using the prior Excel based workflow to deliver meaningful results.

- **Decreased model execution key person risk** with documentation and software process automation. Many essential tasks were only fully executable by one or two employees in a manual process.
- **Implemented a configuration sharing model** linking commonly used business analyst data sources to assets on the cloud. Many business processes are driven by ad-hoc Excel spreadsheets or CSV files scattered on the local file systems of business analyst laptops. My configuration system enabled production loss forecasting models to ingest input data and produce a quarterly assessment in an idempotent manner. This reduced the possibility of introducing model errors by eliminating manual alignment of an ad-hoc mixture of input data files from many different sources by each business analyst.
- **Automated model backtesting** to help analysts optimize and improve their modeling strategies before applying them to real world markets. Current Expected Credit Loss (CECL) backtesting analyst experiment cold start time reduced by 88.6% from 26.4 hours to 3 hours. Hot start time reduced by 96.2% from 26.4 hours to 1 hour. Analysts could run
- **Unified international and domestic allowance calculations** (an estimate linked to expected credit losses on a financial asset that is applied to reduce the carrying amount of the financial asset in the statement of financial position) within a single model to reduce quarterly assessment execution cold start time from between one to two weeks to one day.

Organization: **AGSK LLC**
Role: **Owner, Computer Vision Software Developer**
Dates: October 2017 - February 2019
Tasks, Goals, and Accomplishments:

- Managed a team of machine learning engineers to develop **skin cancer detection algorithms**.
- Worked with stakeholders to identify project scope, budget, performance measurements on real world test data, and reporting findings.
- **Deployed neural networks** on a low resource mobile device.
- **Optimized algorithm performance** using genetic algorithm hyperparameter search, neural architecture search, synthetic image generation using rule-based image augmentation and generative adversarial neural networks, training set undersampling using neighborhood cleaning rule, training set oversampling techniques, saliency analysis with generated heat map overlay, and 2D and 3D PCA for in-browser feature space visualization. Performed lesion segmentation with systems built using **Keras**, **PyTorch**, and **Tensorflow,** and **scikit-learn** machine learning frameworks written in the **Python** programming language and the **NumPy**, **SciPy**, **Pandas**, and **OpenCV** numerical and image processing libraries.

Organization: **SemanticMD**
Role: **Computer Vision Software Developer**
Dates: September 2014 - October 2017

References and Point of Contact: Thomas DeSouza, tel. 503-267-1906
References and Point of Contact: Santosh Bhavani, tel. 281-816-5734
Tasks, Goals, and Accomplishments:
Managed a team of data scientists in the development of:

- **Cellular video annotation tool** built with proven technologies including HTML5, ffmpeg, and Leaflet.js to provide long lasting value to the customer in terms of compatibility and extensibility.
- **Neural network optimal brain damage** resulting in doubling of inference performance at a cost of 0.02% increased error rate.
- **Cardiac ultrasound** ventricle ejection fraction measurement using video analysis.
- **Facial alignment** from unorganized facial images by performing image registration and elastic deformation.
- **Visualization of similar images in 3D space** using a Three.js/WebGL canvas running in a web browser.
- **PACS systems x-ray image extraction** with a self-hosted DICOM server.

Wrote software in the development of:

- **Automation scripts** for on-premises and cloud server infrastructure with Ansible, sh/bash/sh, and Python scripts.
- **Accelerated image processing** using cluster computing methods.
- **Distributed task queues** using Python/Celery.
- **Identification of regions of interest** within an image with command line and REST API.
- **X-ray tuberculosis detector** made available as a REST API.
- **Bounding box annotation tool** designed for maximum annotator throughput.
- **Automatic face crop** tool using a neural network for detection.
- **Skin patches analysis** using Google Cloud Vision (GCV) API.
- **Profile guided optimization** using Numba JIT and Cython.
- **Ultra high resolution image viewer** for 60000x60000 pixel Aperio SVS images in a web browser as tiles of highly compressed JPEG images generated on the fly as the user pans across the canvas.
- **Automated lion facial image extraction** in coordination with 3rd party database developers for **LINC** (Reference and Point of Contact: Justin Downs (justin@iefrd.com)).
- **Identified lion classification algorithms** using probabilistic regression techniques.
- **Developed lion-specific image preprocessing algorithms** including a whisker spot pattern detector.
- **Priced cloud resources optimally** for algorithm deployment.
- **Automated process supervision scripts** to maintain high algorithm API uptime.
- **Tested lion detection algorithm performance** using stratified k-folds cross validation.

Organization: **University of Pittsburgh Drug Discovery Institute**
Role: **Python Web Software Developer**
Dates: December 2013 - September 2014
References and Point of Contact: Human Resources Department, tel. 412-624-7000

Tasks, Goals, and Accomplishments:
Supported development of the Microphysiology Project Database Server, the web interface for University of Pittsburgh experiments under the the DARPA Microphysiology Project: https://www.darpa.mil/program/microphysiological-systems

Organization: **United States Army**
Role: **Intelligence Analyst (35F)**
Dates: November 2011 - August 2013
Tasks, Goals, and Accomplishments:

- Prepared all-source intelligence products to support the combat commander
- Assessed the significance and reliability of incoming information with current intelligence
- Established and maintained systematic, cross-reference intelligence records and files

MILITARY EXPERIENCE

Couponent: **United States Army Reserve**
Type: **Enlisted**
Rank at Discharge: **Specialist**
Military Occupation Code: **Intelligence Analyst (35F)**
Dates: November 2011 - August 2013
Type of discharge: **Honorable**

EDUCATION

Institution: Cochise College
Attendance Dates: May 2012 to July 2012
Degree Earned: **Associate of Applied Science**
Major: Intelligence Operation Studies

PERSONAL INTERESTS

- Coding a spaced repetition software backend in Rust (originally in Golang) and a frontend UI with HTML/CSS/JS (Bootstrap 4 and React 16+).
- Building custom digital first person real-time video guided drones.