NICHOLAS PAYNE

Data Engineering Solutions Architecture

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CATERPILLAR, INC.

Data Engineering, Solutions Architecture, DevOps
Group: Remanufacturing

📅 February 2021-Present   📍 Remote

- Design ETL pipeline solutions with Python and Kedro targeting Docker deployment on AWS Batch with Snowflake and S3 data stores
- Manage AWS infrastructure including S3, Batch, ECS, Sagemaker, CloudWatch, and EventBridge with CloudFormation templates
- Coach data scientists on my team in clean coding, best practices such as git, advanced python coding for data engineering, and Kedro pipeline deployment
- Manage Azure Build Pipelines and help enable/mature our CI/CD strategy
- Build Streamlit apps for visualizing and exploring data with customers to guide our Kedro pipeline developments
- Authored utility library, 'rada', which enables data scientists to quickly iterate on features locally while deploying their code into AWS Batch without waiting on a CI pipeline, right from their terminal

Data Engineer/Scientist
Groups: Excavation Division & Integrated Components and Solutions

📅 January 2019-February 2021   📍 Mossville, IL

- Co-authored Python library for interfacing with controls software of Caterpillar Excavators for automated data gathering and ML activities
- Dockerized ML Pipeline deployment using docker-compose, Python, and python-rq
- Designed an automated data ingestion and grooming pipeline to index and organize data which included deep learning object detection modeling for tagging datasets with desired information
- Designed an Exploratory Data Analysis (EDA) web application with streamlit to explore the data ingested with above-mentioned data pipeline
- Data modeling for commonizing data storage pracitces in the perception space at Caterpillar
- Built a data storage prototype utilizing MySQL and Flask to centralize telematics and kinematics data

Data Scientist
Group: Information Analytics

📅 July 2017-January 2019   📍 Peoria, IL

- Graduated from the Analytics Professional Development Program (2019)
- Worked on Scrum team following Agile development

LOOKING FOR

A team of other disciplined students and tenacious learners who continuously look for ways to improve their live by striving for excellence in their respective passions.

TECHNICAL SKILLS

🐍 Python

- ≡ *Pipeline* | Kedro
- ⚙ *Data Engineering/Science* | Pandas, Numpy, Scipy, Sqlalchemy
- 👁 *Exploration* | Streamlit, Jupyter Notebooks
- 🍰 *Viz* | Plotly, Matplotlib, Seaborn, Hvplot
- ⑂ *Versioning* | MLflow, **git**
- 🖳 *Machine Learning / Deep Learning Frameworks* | Keras / Tensorflow, PyTorch with APex and AMP, SciKit-Learn
- 🧠 *Machine Learning / Deep Learning Algorithms* | Standard sk-learn techniques, object detection + classification

aws AWS

- ≡ *Services* | Batch, EC2, S3, EventBridge, CI/CD, boto3

🗄 SQL

- Schema design and data modeling
- *Databases* | MySQL, Oracle, MS SQL Server, Snowflake

🐳 Containerization

- Docker(-Compose)

📊 Visualization

- Experience building EDA tools with *streamlit*

🗄 Miscellaneous

- 🐧 Linux
- Remote deployment/development
- Vim is the superior editor
- LaTeX
- **git**

q: Which came first, the phoenix or the egg?

- Gained experience in building machine learning models using various frameworks in Python for random forest regressions models, reinforcement learning models, and various deep learning models for computer vision applications

RELATED EXPERIENCE

Hobby Homelabbing
My house

📅 ∞   📍 🏠

- Utilize Ansible for deploying 40 containerized workloads to a self-hosted Ubuntu server
- Manage Jellyfin and Nextcloud instances with multiple users
- Self-host Docker container registry for keeping my used images up to date
- I gain regular experience in systematic thinking in a technical context of modern tooling which as added value to every one of my roles and projects

CERTIFICATES

- Fundamentals of Deep Learning for Computer Vision | *Nvidia*
- Convolutional Neural Networks | *Coursera*
- Structuring Machine Learning Projects | *Coursera*
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization | *Coursera*
- Neural Networks and Deep Learning | *Coursera*

HOBBIES

🍸 **Whisky tasting and cigar pairing**
Enjoying a nice dram

🖥️ **Home-labbing**
Self host all the things!

✴️ **Theology**
Ancient Near Eastern Cosmology as the roots for Biblical exegesis

✌️ **BJJ**
6 year white belt

🥏 **Disc Golf**
Olympics 2024. You heard it here first

STRENGTHS

EDUCATION

MS Applied Mathematics
Iowa State University

📅 2014 - 2016   📍 Ames, IA

CGPA: 3.84/4.0

BS Mathematics
Iowa State University

📅 2011-2014   📍 Ames, IA

CGPA: 3.64/4.0

PATENTS

- **2022** | Excavator Control Mapping System
- **filed** | Vision Based Object Detection Alarm Snooze Strategy for Rotating Machines

CONFERENCES

- neovim.conf 2022 (speaker) | 2021 (participant)
- Nvidia GPU Technology Conference 2019 & 2020
- Hackillinois 2018

PUBLICATIONS

- 📄 **Properties Preserving Schemes for a Kinetic Eikonal Equation** | *J. Comput. Phys. 331(2016)*
- 📄 **An asymptotic method based on a Hopf-Cole transformation for a kinetic BGK equation in the hyperbolic limit** | *J. Comput. Phys. 341: 295-312 (2017)*
- 📄 **A Hopf-Cole transformation based asymptotic method for kinetic equations with a BGK collision operator in the large scale hyperbolic limit** | *Iowa State University Graduate Theses and Dissertations. 15788.*

REFERENCES

Available on request

a: A circle has no beginning