NICHOLAS PAYNE

Data Engineering Solutions Architecture

nic.payne@protonmail.com 319-389-5740 Appleton, WI @pypeaday
nicpayne713 nicpayne713 pypeaday

CATERPILLAR, INC.

Data Engineering, Solutions Architecture, DevOps

Group: Remanufacturing

February 2021-Present Remote

- Build 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
- Coach data scientists on my team in clean coding, best practices such as git, advancted 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 development

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
- 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

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

- *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?

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*

CONFERENCES

- vim.conf 2021
- 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.*

PATENTS

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

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

Volleyball
Because ball is life

Disc Golf
Olympics 2024. You heard it here first

STRENGTHS

Active Learning | Leadership | Coaching | Flexibility and Adaptability | Conflict Resolution | Analytical Thinking

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

REFERENCES

Available on request

a: A circle has no beginning