Erick Shepherd

Enterprise Software Engineer · Oracle Ecosystems · AI-Assisted Tooling

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SUMMARY

I build the enterprise software that quiet, load-bearing business processes run on. For nearly five years I led development of the Oracle APEX and PL/SQL applications behind a national supplemental-health-insurance underwriting pipeline, and along the way introduced the source control and automated testing the team had been working without and co-designed its first CI/CD pipeline.

Before enterprise software, I spent several years in scientific-computing and machine-learning research. At UMBC, under an NSF CyberTraining grant, I built a K-Nearest-Neighbors pipeline on a high-performance computing cluster to collocate satellite cloud observations with sea-ice data. At NASA Goddard, I worked on satellite aerosol remote sensing and wrote two Python tools for the MODIS Dark Target product that were filed as NASA New Technology Reports — one of them eliminating a proprietary licensing dependency from the processing pipeline. It's a genuine ML and scientific-computing foundation that predates the current AI wave rather than riding it.

Today I work fully remote, bringing that span — from satellite data pipelines to production LLM-to-database integrations and self-hosted infrastructure — to Oracle, health-IT, and developer-tooling problems wherever the team happens to be.

EXPERIENCE

Application Development Advisor · Cigna Supplemental Health Services (via Magnit Global) — Aug 2021 – May 2026

Lead and core developer on the Oracle APEX applications powering a national supplemental-health-insurance underwriting pipeline, from quoting through contract generation.

- Lead developer on the quote-entry front end of the underwriting pipeline — used daily by sales, pricing, and underwriting teams — and core developer on the downstream contract-generation tool, across the full tenure.
- Introduced Git and GitHub to a team with no source control, establishing the branching, code-review, and commit standards adopted across the group, with admin over 29 repositories.
- Co-designed the team's first CI/CD pipeline and led the Oracle APEX deployment-workflow integration.
- Designed and built a custom domain-specific language and Python package that compiles PL/SQL objects in correct dependency order across environments — replacing an error-prone manual process — plus a companion VS Code syntax-highlighting extension.
- Built a Python abstraction layer over the OracleDB environments that let Claude, via Cursor Composer, query enterprise databases through a locally-running credentialed utility — one of the team's first production AI integrations.
- Authored an OCR-backed ETL pipeline using pandas and pytesseract that migrated inconsistently structured Excel pricing data — including rate tables embedded as images — into Oracle on upload.
- Mapped dependencies across 15+ applications and hundreds of database objects with graphviz and networkx into architectural reference graphs delivered to leadership.
- Led a four-developer squad: task delegation, code review, and technical direction.

Freelance Systems Engineer · Independent Jul 2020 – Jun 2025

Independent contract engineering spanning embedded/IoT devices, data-analysis pipelines, and web systems.

- Designed and prototyped IoT security devices: embedded firmware in C and Python, custom PCB design, and sensor integration.
- Built data-analysis and automation deliverables over real-world and scientific datasets — including geospatial work (Python/pandas, netCDF, cartopy mapping, statistical analysis) — alongside web development and systems integration.

Radar Systems Engineering Intern · Northrop Grumman Mission Systems Jun 2020 – May 2021

Defense systems engineering on a cleared program (DoD Secret), performed fully remotely.

- Held an active DoD Secret clearance — obtained April 2020; lapsed 2021, eligible for reinstatement — on a cleared defense systems-engineering role performed fully remotely.
- Worked within large-scale defense systems-engineering processes, documentation standards, and cross-functional team workflows.

Sally Ride Intern — Dark Target Aerosol Group · NASA Goddard Space Flight Center Jun 2019 – Dec 2019

Streamlined ground-truth validation and eliminated a proprietary IDL dependency in NASA's MODIS Dark Target aerosol-retrieval pipeline; two tools filed as NASA New Technology Reports.

- Wrote a Python AERONET data-retrieval tool and a Python re-implementation of the IDL CONGRID interpolation routine — both filed as NASA New Technology Reports — eliminating a proprietary IDL licensing dependency from the Dark Target pipeline.
- Showed that near-real-time GFS forecast fields could substitute for older GDAS re-analyses in aerosol retrieval, enabling near-real-time processing; presented at the AGU Centennial Fall Meeting in 2019.
- Selected for the nationally competitive NASA Sally Ride Internship under the Science Mission Directorate.

Advanced Computing in Earth Sciences (ACES) Intern · NASA Goddard Space Flight Center Jun 2018 – Aug 2018

Studied poleward aerosol transport using space-based lidar from the International Space Station.

- Analyzed lidar backscatter and depolarization data from CATS — the Cloud-Aerosol Transport System aboard the International Space Station — and the CALIPSO satellite, characterizing poleward aerosol transport; presented at the GSFC summer intern poster session.
- Selected for the NASA ACES program — 20 students nationally — an intensive in HPC, scientific software engineering, and Earth-science data analysis.

Research Assistant · UMBC — Department of Physics, ACROS Group Aug 2017 – Jun 2020

Atmospheric remote-sensing research on UMBC's Taki supercomputer under an NSF CyberTraining grant.

- Introduced Git/GitHub version control to the ACROS research group — authored and delivered training (including using Git on the Taki HPC cluster); the group adopted it.
- Implemented a K-Nearest-Neighbors algorithm to collocate MODIS satellite cloud observations with NOAA and NSIDC sea-ice measurements, investigating anomalous cloud-opacity discrepancies between MODIS and CALIOP.
- Architected a modular Python package to process NASA CATS (ISS-lidar) data — automated download, HDF5 ingestion, and cloud/aerosol observation-frequency maps and vertical cross-sections — run on the Taki HPC cluster.
- Ran analyses on the Taki HPC cluster (SLURM, GPU, InfiniBand) with NumPy, SciPy, scikit-learn, PySpark, and mpi4py; co-authored conference presentations at the MODIS/VIIRS Science Team Meeting and the

International Radiation Symposium.

SKILLS

Oracle & Databases	Oracle APEX · PL/SQL · Oracle Database · SQL · Liquibase · Database design
Languages	Python · PL/SQL · JavaScript · C / C++ · Java · Fortran · Solidity · MATLAB · Bash · LaTeX
AI & Machine Learning	LLM-to-database integration · Agentic / MCP tooling · Claude / Cursor Composer · Custom GPT development · Deep learning (TensorFlow / Keras) · scikit-learn · Spark MLlib · Random Forest / SVM · K-Nearest-Neighbors · Monte Carlo methods · Voice AI (STT / TTS) · Audio DSP (PyAudio / pydub) · OpenCV · NLP
DevOps & Infrastructure	CI/CD · GitHub / GitHub Actions · Python packaging (PyPI) · Docker · Linux · GitLab · Self-hosted infrastructure · nginx · Email auth (SPF/DKIM/DMARC) · DNS / deliverability · Selenium / WebDriver · Web scraping (BeautifulSoup)
Data & Scientific Computing	NumPy · pandas · SciPy · Matplotlib · HDF4 / netCDF4 · PySpark · mpi4py · HPC / SLURM · ETL · OCR (pytesseract) · Geospatial (Cartopy, Folium)
Security	Red teaming (AI / LLM) · Network reconnaissance (scapy / nmap) · Packet crafting & sniffing · Applied cryptography (PGP, Fernet) · Steganography / covert channels
Embedded & Hardware	Embedded C / Python firmware · PCB design · Sensor integration · Raspberry Pi · Arduino

EDUCATION

B.S. Physics — coursework completed, two courses remaining · University of Maryland, Baltimore County — 2017 – Present

Degree not yet conferred; completion in progress through the UMBC Finish Line Program.

A.S. in STEM — High Honors · Frederick Community College — 2011 – 2015

Martin Kalmar Award for Academic Excellence in Mathematics; Who's Who Among Students in American Colleges & Universities; AMATYC Student Mathematics League Certificate of Merit (National Mathematics Competition).

Advanced Computing for Earth Sciences (ACES) Program · University of Virginia / NASA — 2018 – 2018

Selective NASA-sponsored intensive in HPC, scientific software engineering, and Earth-science data analysis — 20 students nationally.

CERTIFICATIONS

Oracle APEX Cloud Developer — Oracle Certified Professional — Oracle University, Oct 2023 · ID 306102873APEX23OCP

The Complete PL/SQL Bootcamp — Udemy, Aug 2022 · ID UC-9cf5e3ac-30e8-4273-8c6b-57016b88c5e2

Complete Python Course — Udemy, Aug 2022 · ID UC-347ed17f-e5f5-4d7b-becc-722d5a61d909

Introduction to Programming with MATLAB — Vanderbilt University · Coursera, Jun 2020 · ID PSE9FDG3MEVU

Advanced Computing for Earth Sciences (ACES) Program — University of Virginia · NASA, Jun 2018

NASA GSFC Internship Completion — NASA Goddard Space Flight Center, Aug 2019

MATLAB 2018 Essential Training — LinkedIn Learning, Jun 2020 · ID AapNQhQVEVXKPydVqMtcl_DMB5xa

MATLAB Fundamentals — Skillsoft (via Northrop Grumman), Jun 2020 · ID sd_matl_a01_it_enus

Certified Pharmacy Technician (CPhT) — PTCB, Jan 2016 – Jan 2018 (expired) · ID 30000976

SoloLearn: HTML — SoloLearn, Nov 2016 · ID CT-FHI5DRI4

SoloLearn: CSS — SoloLearn, Nov 2016 · ID CT-PCPERYTX

SoloLearn: JavaScript — SoloLearn, Nov 2016 · ID CT-WBHPUHYW

SoloLearn: Java — SoloLearn, Nov 2016 · ID CT-2F0JPAHE

SoloLearn: PHP — SoloLearn, Nov 2016 · ID CT-YWAULVUG

SoloLearn: SQL — SoloLearn, Nov 2016 · ID CT-KKTB8GAO

SoloLearn: Python Core — SoloLearn, Mar 2017 · ID CT-SPFUZ6C3

SoloLearn: C++ — SoloLearn, Mar 2017 · ID CT-5HWVPLS4

SoloLearn: Ruby — SoloLearn, May 2020 · ID CT-FEXBP8CO

SoloLearn: C — SoloLearn, May 2020 · ID CT-EQOMYQPY

SoloLearn: Data Science — SoloLearn, May 2020 · ID CT-CXKDPFZK

SoloLearn: Machine Learning — SoloLearn, May 2020 · ID CT-DKUDUEMQ

SoloLearn: Swift 4 — SoloLearn, Jun 2020 · ID CT-ZOZMNBUX

SELECTED PUBLICATIONS

1. Shepherd, E., et al. (Dec 2019). Assessing the Use of Forecast Meteorological Analyses to Support Aerosol Retrieval in Near Real-Time. AGU Centennial Fall Meeting, San Francisco, CA.
2. Zhang, Z., Shepherd, E., et al. (Nov 2019). Understanding the Quantitative Connection Between Cloud Opacity and Cloud Optical Thickness Using CALIOP and MODIS Observations. 2019 MODIS/VIIRS Science Team Meeting, College Park, MD.
3. Zhang, Z., Shepherd, E., & Wang, C. (Jun 2020). Investigation of Anomalous Transparent Clouds Based on MODIS and CALIPSO Observations. 2020 International Radiation Symposium, Thessaloniki, Greece (conference canceled, COVID-19).
4. Shepherd, E. & Levy, R. (Aug 2019). Streamlining Ground-Truth Validation and Algorithm Improvement for the Dark Target Aerosol Research Product. NASA GSFC Summer 2019 Intern Poster Session, Greenbelt, MD.