

JACK SHKIFATI

Machine Learning & Software Engineer

347-575-3642 • jackshkifati@gmail.com • linkedin.com/in/jack-shkifati • jackshkifati.com

SUMMARY

Machine Learning & Software Engineer with 3+ years shipping end-to-end production ML and backend systems, including pioneering a patented Dynamic Product Labeling system at PepsiCo and deploying computer vision to 100+ edge devices across four international markets. Expert in C++ and Python for low-latency edge deployment (ONNX, TensorRT, OpenVINO), concurrent backend systems, and IoT telemetry infrastructure (MQTT, AWS). B.S. Computer Engineering, NYU Tandon, Cum Laude.

SKILLS

Programming Languages: C/C++, Python, Java

Machine Learning: YOLO, OpenCV, PyTorch, Keras, Scikit-learn, NumPy, Pandas, Matplotlib

Backend & API: FastAPI, Flask, Django, REST, WebSocket, MQTT, HTTP/HTTPS

Databases & Cloud: AWS (EC2, S3), PostgreSQL, MySQL, MongoDB, SQLite, Firebase

Tools, Testing & CI/CD: Git, GitHub Actions, pytest, unittest, Jupyter/Colab, PM2, ADB

WORK EXPERIENCE

PepsiCo

Valhalla, NY

R&D Software & AI Engineer

Jul 2023 – Jan 2026

- **Software & Computer Vision Lead:** Led end-to-end software and computer vision development for IoT smart vending across France, Australia, India, and Poland — owning the full lifecycle from design and implementation through testing, deployment, and production monitoring with continuous improvement loops — scaling to 100+ units per market.
- **Patented Invention:** Invented a Dynamic Product Label device (patent filed): engineered the hardware and firmware coupling YOLO classification with an independent tracking model to project a digital grid mapping products to segmented LCDs.
- **Model Fine-Tuning & Edge Acceleration:** Fine-tuned existing PyTorch-based object detection architectures (e.g., YOLO) for real-time beverage bottle recognition; optimized and converted model weights using hardware accelerators (ONNX, OpenVINO) to significantly decrease inference latency for live edge deployment.
- **Computer Vision Engineering:** Derived a first-principles mathematical model for real-time volumetric calculation, eliminating dependence on static reference markers; integrated YOLO and OpenCV stereo vision to estimate volume for moving and partially occluded objects, enabling dynamic pricing on mixed inventory.
- **Hardware-Software Co-Design:** Architected a depth-based stereo vision algorithm in OpenCV and C++ to infer door states, replacing error-prone RF sensors; eliminated field service calls, relaxed OEM assembly tolerances, and reduced hardware BOM cost by 20%.
- **Payment Systems Integration:** Structured a unified payment subsystem integrating global processors (Nayax, Pax, UPI); developed a fault-tolerant pre-authorization and pre-authorization and incremental/decremental settlement flow for secure, unattended vending transactions under intermittent edge connectivity.
- **IoT Telemetry Architecture:** Engineered a low-latency NAMA Vending Data Interchange (VDI) telemetry pipeline; developed custom firmware extracting data directly from the vending machine edge device to parse and transmit bidirectional hardware states over MQTT, ensuring fault-tolerant cloud synchronization and sustaining 99.2% subsystem uptime across 100+ international units.
- **ML Validation:** Replaced an informal test procedure with a statistically rigorous validation suite (99% confidence intervals); used root-cause analysis on misclassifications to drive iterative retraining and architecture changes, improving classification accuracy from a ~88% baseline to 99% in production.

- **Automated Testing Infrastructure:** Developed a black-box and performance testing pipeline (unit, system, integration, load/stress) in Python and ADB, increasing test coverage by 30% across firmware, Android app, cloud, and peripheral subsystems.

NYU Tandon Medical IoT Device (SkiCad)

Brooklyn, NY

Undergraduate Researcher

Sep 2022 – Jun 2023

- **Firmware & Full-Stack Pipeline:** Built ESP8266 firmware and a FastAPI + Firebase backend for an EIS skin-measurement device: streamed sensor data over HTTP, stored it in Firestore, and generated impedance/phase visualizations (matplotlib, cubic-spline interpolation).

NYU Tandon Smart Wearable Bio-Tracker

Brooklyn, NY

Undergraduate Researcher

Jun 2022 – Aug 2022

- **Applied Signal Processing & Network Optimization:** Applied surface mechanomyography (sMMG) using differential accelerometer readings to capture muscle signals for real-time hand-movement prediction and increased wireless transmission rate 40× (50 Hz → 2 kHz) by migrating to UDP, enabling responsive prosthetic control.

PROJECTS

Quantitative Forex Signal Engine (Python · AWS EC2 · GitHub Action) [Link](#)

Jan 2026

- **Architecture:** Built a 24/7 automated signal-detection system in Python utilizing the Oanda v3 REST API (**requests**, **json**) to flag high-probability forex setups; designed an extensible OOP architecture with an abstract **BaseStrategy** class decoupling the core engine (threading, API clients, persistence) from strategy logic.
- **Concurrency:** Monitored 68+ currency pairs concurrently via a producer-consumer pattern; a master dispatcher batches strategy-thread updates into single Telegram broadcasts to eliminate thundering-herd load, with exponential backoff and randomized jitter handling HTTP 429 rate limits.
- **Deployment & CI/CD:** Deployed on AWS EC2 under PM2 process management, utilizing built-in Python libraries (**os**, **sys**) for environment configuration, and implemented a thread-safe SQLite ledger for crash recovery; established a branch-based Git workflow with GitHub Actions to automate CI/CD testing and deployment pipelines.

Air Ticket Reservation System (Python Flask · MySQL) [Link](#)

Jan 2023

- **Relational Database Design:** Designed a normalized MySQL relational database for a dual-interface flight reservation system, modeling customers, staff, flights, airplanes, airports, tickets, and ratings through ER and relational schema diagrams with enforced primary/foreign-key constraints.
- **Application:** Built the application in Python Flask with an HTML/CSS front end and session-based authentication for customer and staff roles; implemented aggregate SQL queries for spending tracking, revenue reporting, frequent-customer analysis, and month-wise sales.

Breast Cancer Survivability Prediction (Python · Scikit-learn · Keras) [Link](#)

Jan 2022

- **Model Selection & Hyperparameter Tuning:** Compared logistic regression, SVM, and neural network families for survivability prediction on clinical staging data; systematically tuned regularization (L1/L2), polynomial feature transformations, SVM kernels (linear/poly/RBF), and network architectures to identify the best-performing model.
- **Preprocessing & Results:** Handled class imbalance via SMOTE and scaled features with MinMaxScaler; the selected model (logistic regression with L1 regularization and cubic features) improved test accuracy from a 78.5% baseline to 91.3%.

EDUCATION

New York University, Tandon School of Engineering

Brooklyn, NY

B.S. in Computer Engineering, Minor in Science & Technology Studies

GPA: 3.8