

PAUL RAMIREZ-LOPEZ

Applied Computer Vision Engineer

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Florida | Open to Remote & Relocation | U.S. Citizen | Clearance Eligible

PROFESSIONAL SUMMARY

Applied Computer Vision Engineer with approximately 3.5 years of paid R&D experience building practical computer-vision and image-processing workflows for PCB and microelectronics inspection, hardware assurance, AutoBOM systems, and counterfeit-detection research. Experience spans object detection, anomaly detection, OCR/text detection, component classification, image segmentation, dataset engineering, large-scale annotation, multimodal imaging research, customer/SBIR delivery, and technical project leadership.

Strongest professional background is in messy physical-world vision problems where the data, labels, imaging conditions, and deployment constraints are part of the engineering challenge. Currently focused on applied CV roles involving industrial inspection, remote sensing, geospatial imagery, object detection, and deployable vision applications.

CORE TECHNICAL AREAS

Computer Vision Tasks: Object Detection, Object Classification, Anomaly Detection, Image Segmentation, OCR, Scene Text Detection, Feature Extraction & Visual Association, Image Processing, Dataset Annotation & Curation, Remote-Sensing Object Detection

Frameworks & Models: PyTorch, TensorFlow/Keras, Ultralytics YOLO, YOLO11-OBb, YOLOv4, SAM3, EfficientNet, ResNet, RetinaNet, Tesseract, EAST, CRAFT, CLIP, Swin Transformer, DETR/DINO

Data & Annotation Workflows: CVAT, Bounding Boxes, Oriented Bounding Boxes, Segmentation Masks, COCO, DOTA, HBB-to-OBb Conversion, Mask/OBB Conversion, Annotation QA, Dataset Tiling, Parent-Space Annotation Recovery

Engineering Tools: Python, OpenCV, ONNX Runtime, Docker, FastAPI, REST APIs, Git, Linux/WSL, SvelteKit, TypeScript

PROFESSIONAL EXPERIENCE

Caspia Technologies - Gainesville, FL

Research & Development Engineer | Oct 2022 - Oct 2024

Applied CV/R&D role focused on PCB and microelectronics inspection, AutoBOM and counterfeit-detection research, dataset engineering, technical delivery, and project leadership.

- Contributed to AutoBOM and counterfeit-detection R&D programs that converted PCB imagery into structured component, marking, text, orientation, and inspection metadata through computer vision, OCR, classification, segmentation, and visual-association workflows.
- Helped develop surface-mount component detection/classification and board/component-marking recognition subsystems, producing itemized outputs with class labels, localization, orientation, text/markings contents, and component-to-reference-designator associations.
- Built and supported YOLO-based IC/chip detection and counterfeit/anomaly-detection prototypes, including pin-counting, IC surface anomaly analysis, and augmentation experiments for scarce defective/counterfeit examples.
- Expanded a derived PCB vendor-logo and marking dataset to ~7,000 instances across ~1,300 marking types and helped scale manual annotation work to ~300,000 total labels across components, markings, text, orientation, masks/OBBs, and OCR-support metadata.
- Authored an independent ~40-page multimodal inspection feasibility study covering SWIR, infrared, X-ray, and other sensing methods; helped justify acquisition of a high-end SWIR imaging station and established early experimental imaging workflows.
- Produced weekly technical presentations and official monthly SBIR deliverables; onboarded and directed junior engineers across Physical Assurance workstreams supporting customer, government, and commercialization milestones.
- Served as Entrepreneurial Lead for a seven-week NSF I-Corps commercialization effort, conducting 100+ stakeholder interviews to evaluate AutoBOM and counterfeit-detection market fit across electronics manufacturing, inspection, procurement, recycling, and supply-chain security.

Florida Institute for Cybersecurity Research - Gainesville, FL

Research Assistant | May 2021 - Oct 2022

Hardware-assurance research foundation in PCB inspection, image processing, dataset construction, annotation, and ML experimentation.

- Supported early hardware-assurance and PCB inspection research that later expanded into AutoBOM and counterfeit-detection workstreams, contributing across dataset construction, annotation, image processing, and ML experimentation.
- Developed PCB image auto-scaling and resolution-estimation workflows using reference-object detection, PCB boundary detection, edge/contour analysis, and known physical-reference geometry to estimate image PPI under inconsistent capture conditions.
- Built the initial PCB vendor-logo and marking dataset, curating ~3,000 examples across ~800 marking types for downstream vendor-logo, standards-marking, and board-marking recognition.
- Produced ~70,000 PCB annotations across components, markings, and text-related metadata, including localization, orientation, and class labels.
- Explored GAN-based synthetic counterfeit/defect generation for hardware-assurance datasets, identifying scarce confirmed negative examples and high visual variability as primary blockers to usable augmentation.

Admiral - Gainesville, FL

Account Development Representative -> Customer Success Representative | Jul 2018 - Aug 2021

Customer-facing SaaS experience in business development, customer success, technical support, issue resolution, and account communication.

- Supported outbound sales, lead generation, client qualification, customer support, issue resolution, and account-satisfaction workflows for a SaaS platform serving digital publishers.
- Managed publisher and visitor support communication to maintain account satisfaction and resolve product-related issues.
- Built early experience translating customer needs, product issues, and account feedback between users and internal teams.

Harry's Seafood Bar & Grille - Gainesville, FL

Server's Assistant / Busser | Jun 2017 - Nov 2017

- Supported front-of-house restaurant operations, table turnover, guest service, and team coordination in a high-volume service environment.

Sam's Club - Gainesville, FL

Member Services Cashier | Jun 2016 - Feb 2017

- Supported member service, point-of-sale transactions, customer questions, and front-end retail operations.

SELECTED PROJECT

Maritime Vessel Detection - Oriented Object Detection for Remote-Sensing Imagery Independent Computer Vision Project | 2024 - 2026

YOLO11-OBb, PyTorch, Ultralytics, SAM3, OpenCV, ONNX Runtime, CVAT

- Built an end-to-end maritime object-detection pipeline from DOTA v2.0, xView, and HRSC2016-MS, including dataset filtering, HBB-to-OBb conversion, parent-space annotation recovery, annotation-aware tiling, and two manual curation passes totaling 175+ hours.
- Designed a reproducible dataset-audit and training workflow that resolved duplicate/missing tile annotations, preserved maritime hard negatives, evaluated small-object filtering, pixel expansion, input resolution, augmentation, and multi-seed robustness, and maintained parent-level annotation provenance.
- Trained and selected a YOLO11m-OBb detector at 1280 px input, reaching 0.7067 mAP50-95, 0.9567 precision, and 0.8620 recall; geometric rotation/flip augmentation produced repeatable gains across paired multi-seed tests.
- Final curated dataset included 5,351 image/label pairs and 98,768 oriented vessel annotations; building a deployable inference demo and long-form case study documenting dataset decisions, training experiments, error analysis, deployment tradeoffs, and real-world limitations.

0.7067 mAP50-95	0.9567 Precision	0.8620 Recall	1280 px Input	YOLO11m-OBb Model	175+ hrs Manual Curation
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EDUCATION

University of Florida - Gainesville, FL

Bachelor of Science in Business Administration | May 2020

Major: Management | Minor: Entrepreneurship | GPA: 3.25 / 4.0

TECHNICAL TRAINING & CERTIFICATIONS

Computer Vision / Machine Learning / AI

- **Computer Vision Specialization** - University of Colorado Boulder | Issued Apr 2026 | Credential ID: AWGTNN38KPOG
- **PyTorch for Deep Learning Specialization** - DeepLearning.AI | Issued Mar 2026 | Credential ID: A9O0B800MW7M
- **Machine Learning Specialization** - Stanford Online / Coursera | Issued Feb 2026 | Credential ID: KWBjt4DBONT5
- **Statistics with Python** - University of Michigan | Issued Dec 2025 | Credential ID: AVZ3QYO3GPOZ
- **Mathematics for Machine Learning** - Imperial College London | Issued Nov 2025 | Credential ID: AQDAS7N6NCFI
- **Python for Everybody Specialization** - University of Michigan | Issued Oct 2025 | Credential ID: SRDXW5HT8ZW5
- **Introduction to Data Science in Python** - University of Michigan / Coursera | Jan 2025
- **Deep Learning Specialization** - DeepLearning.AI / Coursera | Feb 2020
- **Introduction to Computer Vision** - GeorgiaTech / Udacity | Mar 2020
- **Machine Learning Specialization** - Stanford Online / Coursera | Jan 2020
- **Machine Learning A-Z** - SuperDataScience / Udemy | Jan 2020

Web Development / Software

- **Svelte & SvelteKit: The Complete Guide** - Ali Alaa / Udemy | Jun 2025
- **Responsive Web Design Certification** - freeCodeCamp | Dec 2019
- **The Web Developer Bootcamp** - Colt Steele / Udemy | Jan 2020

LEADERSHIP & INVOLVEMENT

NSF I-Corps

Entrepreneurial Lead | Mar 2023 - May 2023

- Participated as a Caspia employee in a seven-week NSF I-Corps commercialization and customer-discovery program focused on AutoBOM and counterfeit/defect-detection technology.
- Conducted 100+ stakeholder interviews across electronics manufacturing, inspection, procurement, recycling, and supply-chain security.

Entrepreneurship Club - University of Florida

Board Member, Marketing and Promotion | Sep 2016 - May 2020

- Supported marketing, promotion, and student-organization programming for entrepreneurship-focused events and initiatives.

PorColombia Club - University of Florida

Board Member, Marketing and Promotion | Sep 2016 - May 2017

- Supported marketing and promotion for student programming related to Colombian culture and community engagement.

Food4Kids Backpack Program - Gainesville, FL

School Club President | Sep 2014 - Dec 2016

- Organized student volunteer groups supporting local food-access programming.

AWARDS & HONORS

Eagle Scout Rank - Boy Scouts of America, Troop 125

Gainesville, FL | Dec 2015

- Directed multi-crew operations for an Eagle Scout service project involving deconstruction, site preparation, rebuild execution, materials/tool logistics, task delegation, pacing, and safety.
- Reopened a local trail segment and mitigated a safety hazard involving a 52-foot leaning bridge over a creek for the San Felasco Hammock Preserve mountain biking and trail-running community.