

PAUL RAMIREZ-LOPEZ

Computer Vision Engineer

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

PROFILE

Applied Computer Vision Engineer with 3+ years of paid R&D experience developing practical computer-vision and image-processing workflows for PCB and microelectronics inspection, hardware assurance, and automated inspection systems. Experience spans object detection, OCR and text analysis, component classification, anomaly-detection research, dataset engineering, large-scale annotation, multimodal imaging research, customer/SBIR delivery, and technical project leadership.

SELECTED 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, and technical delivery.

- 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, and visual-association workflows.
- Developed and supported PCB inspection subsystems including YOLO-based integrated-circuit detection, surface-mount component classification, board/component-marking recognition, OCR/orientation workflows, and component-to-reference-designator association.
- Expanded a PCB vendor-logo and marking dataset to ~7,000 instances across ~1,300 marking types and contributed to ~300,000 total manual annotations spanning components, markings, text, orientation, reference-designator relationships, and OCR-support metadata.
- Investigated counterfeit and defect-detection approaches under severe data scarcity, including synthetic-data augmentation experiments and image-based surface inspection workflows for microelectronic components.
- 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 system and established initial experimental PCB imaging workflows.
- Produced weekly technical presentations and monthly SBIR-style deliverables documenting model development, dataset status, technical risks, and project milestones; onboarded and coordinated junior engineers across Physical Assurance R&D workstreams.
- Served as NSF I-Corps Entrepreneurial Lead for a seven-week commercialization program, conducting 100+ stakeholder interviews 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, 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 machine-learning 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 limitations to usable augmentation.

Admiral — Gainesville, FL

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

Earlier SaaS customer-facing experience in outbound sales, customer success, issue resolution, and account communication.

- Supported outbound sales, customer success, issue resolution, and account communication for a SaaS platform serving digital publishers.
- Built early experience translating customer needs and product issues between users and internal teams.

FEATURED PROJECT

Maritime Vessel Detection

An audit-driven remote-sensing detection workflow built around DOTA v2.0, xView, and HRSC2016-MS. The work emphasizes annotation quality, parent-space coordinate handling, OBB conversion, tiling, curation, controlled augmentation, and multi-seed evaluation.

0.7067 mAP50-95	0.9567 Precision	0.8620 Recall	1280 px Input	YOLO11m-ORB Model	175+ hrs Curation
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TECHNICAL AREAS

Computer Vision Tasks: Object Detection · Image Processing · OCR and Scene Text Detection · Feature Extraction & Association · Anomaly Detection · Image Segmentation · Training & Inference Optimization

Models and Frameworks: PyTorch · OpenCV · Ultralytics YOLO · SAM-Assisted Labeling · Tesseract, EAST, and CRAFT

Data and Experimentation: Dataset Curation · Annotation QA · Oriented Bounding Boxes · Segmentation Masks · Tiling Pipelines · Experiment Design / Ablation Testing · Domain-shift Analysis

Deployment and Engineering: Python · Docker · FastAPI · SvelteKit · ONNX Runtime · Git · Linux

EDUCATION AND TRAINING

B.S. Business Administration, Management; Minor in Entrepreneurship — University of Florida, Gainesville, FL | May 2020

Computer Vision Specialization - University of Colorado Boulder · PyTorch for Deep Learning - DeepLearning.AI · Deep Learning Specialization - DeepLearning.AI · Machine Learning Specialization - Stanford/DeepLearning.AI · Mathematics for Machine Learning - Imperial College London · Python for Everybody - University of Michigan · Statistics with Python - University of Michigan