About Me

I am Roderick L. Renwick (Rory), a Computer Engineering graduate with specialized expertise in applied machine learning, computer vision, and VLSI digital design. With a Master's degree from Purdue University and proven experience at Raytheon Technologies Research Center, I bring a unique combination of theoretical depth and practical innovation to every project. My passion lies in architecting intelligent systems that bridge the gap between cutting-edge research and real-world applications.

5+	10+	3
Years ML/CV Experience	Completed Projects	Research Publications

Education

Purdue University, West Lafayette, IN

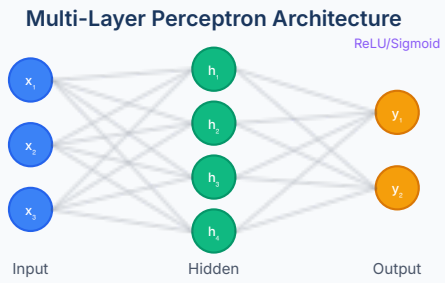
Master of Science in Electrical & Computer Engineering (Fall 2022)

Specialization: Signal & Image Processing, Deep Learning, Neural Networks, VLSI Design

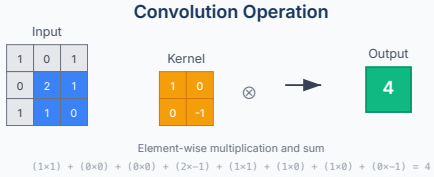
Key Coursework

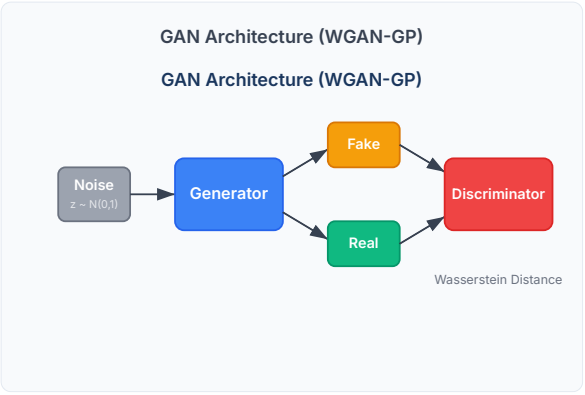
COURSE TITLE	AREA/NUMBER	FOCUS
Introduction to Deep Learning	ECE 59500	CNSIP & EE
Introduction to Neural Networks	ECE 62900	CE & CNSIP
Deep Learning	ECE 69500	CE & VLSI
Electromagnetic Field Theory	ECE 60400	FO
Random Variable and Signals	ECE 60000	CNSIP
Boltzmann Law: Physics to ML	ECE595	MN
Computer Vision on Embedded Systems	ECE595	CE
Globalization & Engineering	ENE554	N/A

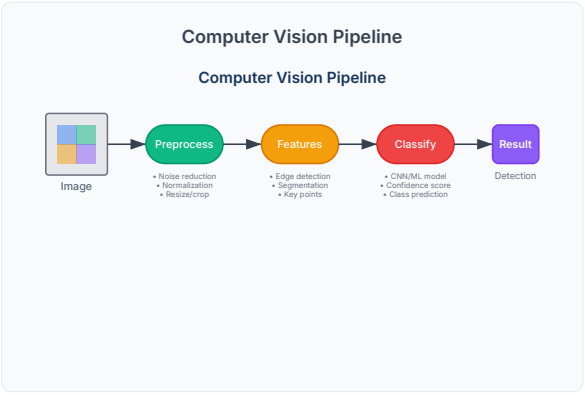
Multi-Layer Perceptron Architecture



Convolution Operation







University of Michigan, Dearborn, MI

Bachelor of Science in Computer Engineering (Winter 2020)

Graduated with Distinction | Autonomous Vehicle Research Assistant
Focus: Digital Design, Computer Vision, Autonomous Systems

Professional Experience

Raytheon Technologies Research Center (RTRC)

Summer 2023

Machine Learning Research Intern - AI Research Laboratory

Conducted advanced research in applied machine learning and computer vision within Raytheon's core research center. Developed novel algorithms for aerospace and defense applications, collaborating with senior research scientists on

cutting-edge AI initiatives. Received commendation letter from Pratt & Whitney and RTRC leadership for exceptional research contributions.

Deep Learning | Computer Vision | TensorFlow | Aerospace AI

University of Michigan - Dearborn

2018-2020

Research Assistant, Machine Learning

Core team member for Michigan Dearborn Autonomous Shuttle development. Designed and implemented end-to-end machine learning pipeline for real-time sensory feedback processing and decision-making systems.

CNNs | Autonomous Systems | Real-time Processing

Ford Motor Company

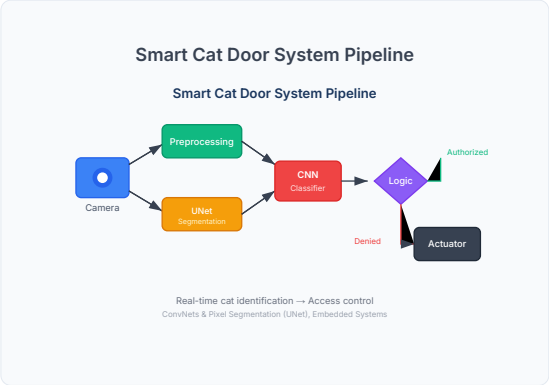
Summer 2017

Intern, Functional Safety & Battery Architecture

Participated in ISO 26262 functional safety protocols for next-generation vehicle platforms. Conducted competitive benchmarking for Battery Management IC selection and contributed to advanced battery electronics architecture.

ISO 26262 | Battery Systems | Automotive Electronics

Featured Projects

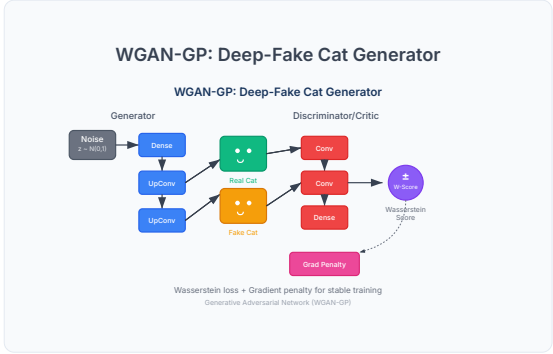


Smart Cat Door System

ConvNets & Pixel Segmentation (UNet), Embedded Systems

AI-powered cat identification and access control system. Implemented complete pipeline from image gathering, UNet segmentation, CNN training, to real-time embedded deployment.

View Demo → Report v2.0 →

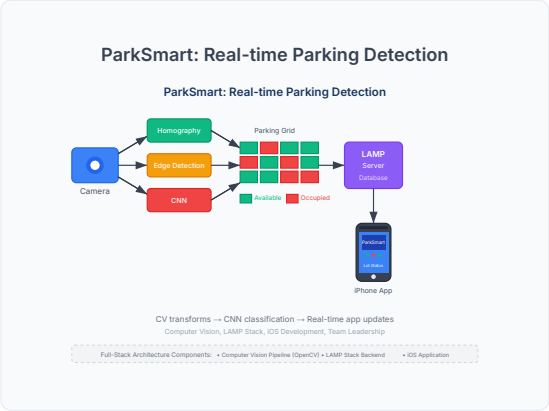


Deep-Fake Cat Generator (Remy)

Generative Adversarial Network (WGAN-GP)

Designed and implemented Wasserstein GAN with Gradient Penalty for high-fidelity synthetic image generation. Explored advanced optimization techniques for training stability.

View Demo →

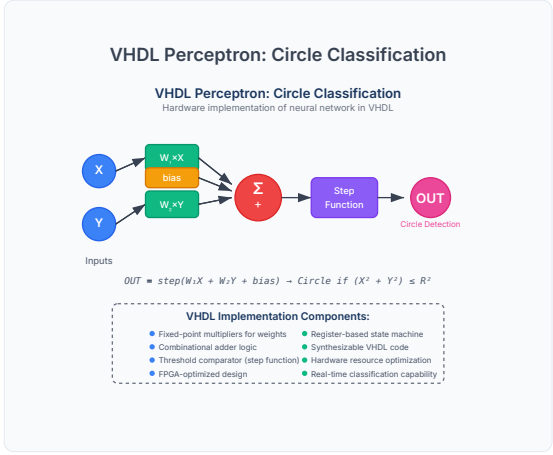


ParkSmart iPhone Application

CNN, Affine & Perspective Transforms, OpenCV, LAMP Stack

Led senior design team in developing comprehensive parking management system. Integrated computer vision, web backend, and mobile frontend for real-time vacancy detection.

Full Report →



VHDL Perceptron Implementation

Multi-Layer Perceptron (MLP), VHDL, Digital Design

Hardware neural network implementation in VHDL. Translated Python MLP to optimized hardware description with focus on combinational logic reduction.

View Report →

Technical Skills

Computer Vision

- Image Segmentation (UNet)
- Object Detection & Classification
- Homography & Transforms
- Edge Detection (Canny)
- Feature Extraction (ORB-SLAM)

Machine Learning

- Convolutional Neural Networks
- Generative Adversarial Networks
- Multi-Layer Perceptrons
- Backpropagation & Training
- PCA & Dimensionality Reduction

Digital Design

- VHDL Hardware Description
- VLSI Circuit Design
- CMOS Logic Design
- Digital Signal Processing
- FPGA Implementation

Programming

- Python (TensorFlow, OpenCV)
- C/C++ Systems Programming
- MATLAB Signal Processing
- Web Development (LAMP)
- Assembly & Low-level

Systems & Platforms

- Embedded Systems Design
- AWS Cloud Computing
- Linux/Unix Administration
- Real-time Processing
- Database Systems (SQL)

Research & Analysis

- First Principles Thinking
- System Architecture Design
- Technical Documentation
- Algorithm Optimization
- Performance Analysis

Core Technology Proficiency

Get In Touch

I'm passionate about pushing the boundaries of machine learning and computer vision. Whether you're looking for innovative solutions, research collaboration, or technical expertise, I'd love to connect.

Contact Information

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www.r0ry.com(Project Site)

Bloomfield Hills, MI 48302

Send a Message

Full Name

Email Address

Message

Send Message