

VASKEN DERMARDIROS

PhD, Engineer, MAsC | ML/AI Engineer | Clima/HealthTech

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Machine learning engineer with 15+ years delivering production AI systems across building, energy, healthcare, and transportation sectors. Built and scaled ML infrastructure serving 2000+ models, reduced training data requirements by 80%, and deployed real-time control systems achieving 20% efficiency gains. Led engineering teams in high-growth environments and secured multi-million dollar partnerships through technical innovation.

Professional Experience

listing my most impactful contributions

[Aescia Health](#), Montreal, Canada (Remote from Barcelona, Spain)

CTO and Co-Founder – June 2025-Present

Aescia Health is a start-up providing medical discharged patients a structured recovery journey while allowing hospital staff to monitor their progress and reduce costly readmissions.

- + [Clinical trials on-going](#) at the Royal Prince Alfred Hospital in Sydney, Australia
- + Deployed LLM-RAG system processing discharge summaries into personalized care plans.
- + Designed and built secured SOC2 and HIPAA-compliant healthcare platform automating post-discharge patient workflows with interactive tools to ease healthcare staff work.
- + Designed and built UI/UX for both the patient-facing and medical staff-facing apps.
- + LLM-based embellisher and answer parser to make structured Q&A follow-up feel natural.
- + Scaling through [District 3](#) Accelerator program in Montreal, securing early partnerships.

[RailVision Analytics](#), Montreal, Canada

Senior Machine Learning and Simulation Engineer – November 2023-January 2025

RailVision Analytics is a seed stage start-up with the goal to enable self-driving efficient trains.

- + Rewrote the legacy train physics simulator in JAX to allow up to 1000x faster simulations with improved prediction accuracy, which unlocked the ability to onboard customers immediately. The simulator incorporates kinematics-based data cleansing, individual car dynamics and residual modeling, with gradient-based calibration and control capabilities.
- + Deployed real-time recommendation system achieving 20% fuel efficiency for freight customers and 15% for passenger rail while maintaining travel schedules.
- + Validated system through 4 successful on-train runs with locomotive engineer buy-in.
- + Built production ML pipeline with automated deployment to AWS infrastructure.

[BrainBox AI](#) (now part of [Trane](#)), Montreal, Canada

Senior Machine Learning Engineer – August 2022-October 2023

BrainBox AI is a ClimaTech company dedicated to reducing energy and carbon emissions of retail and office buildings through HVAC optimization.

- + Architected LLM agents for parsing specifications and analysing operational data reliably.
- + Reduced training data requirements by 80% through scientific ML approaches, accelerating customer onboarding from weeks to days.
- + Built the digital twin framework enabling rapid prototyping of building control strategies.
- + Led technical due diligence supporting multi-million dollar funding rounds and partnerships.
- + Submitted 2 US/Canada patents as the main inventor and published 4 research articles.
- + Delivered ML platform enabling acquisition by Trane.

Engineering Manager, AI Department – April 2020-August 2022

- + Scaled ML infrastructure from dozens to 2000+ models serving various services in production.
- + Architected end-to-end ML pipelines for HVAC control and anomaly detection.
- + Built automated model lifecycle management eliminating maintenance overhead.
- + Grew and led a team of 12 engineers, promoting 3 to management roles.

Machine Learning Engineer – May 2019-April 2020

- + Built temperature prediction framework deployed across 50+ commercial buildings.
- + Implemented optimization and RL-based HVAC control achieving 15-25% energy savings.
- + Bridged AI and HVAC domain expertise through technical knowledge transfer initiatives.

Concordia University, Montreal, Canada

Research Scientist and Teaching Assistant – 2009-2011, September 2013-January 2021

- + Secured research partnerships with 3 major energy organizations: [Hydro-Québec](#) [LTE-IREQ](#), [Régulvar](#) & [NRC-CanmetENERGY](#).
- + Published 5 peer-reviewed articles and 11 conference papers, presented internationally.
- + Delivered industry workshop training 30+ professionals in Python-based energy analysis.
- + Designed solar skylight prototype and [LEED](#) community achieving large energy savings.

Bouthillette, Parizeau et Associés (BPA), Montreal, Canada

MEP Engineer – May 2011- June 2013

BPA provides mechanical, electrical, structural, and sustainability engineering services.

- + Designed mechanical systems for healthcare and commercial clients: plans & specifications.
- + Built automated [CAD/BIM](#) workflows reducing design time and improving coordination.

Technical
Knowledge

- + Production: AWS (ECS, ECR, S3, CodeArtifact), GCP, FastAPI, Docker, Kubernetes, Airflow, Supabase, PostgreSQL, MongoDB, InfluxDB, Grafana, ClearML, Vercel, Terraform/grunt
- + ML & Scientific Computing: Python (JAX, PyTorch, Tensorflow, Keras, SciKit-learn, CVXPY)
- + Agentic deployments: Pydantic Agents, Langfuse, llama.cpp, RAG, OpenClaw
- + Full-Stack Development: TypeScript/JavaScript, React, Node.js, HTML/CSS
- + Development: Git, Linux, Vim, Bash, C/C++ (embedded systems)

Education

Doctor of Philosophy (PhD) in [Building Engineering Concordia University](#), 2015-2020.

"Data-Driven Optimized Operation of Buildings with Intermittent Renewables and Application to a Net-Zero Energy Library", supervised by [Andreas K. Athienitis](#) and [Scott Bucking](#). Thesis defence graded as "outstanding". Link: bit.ly/VDermPhDDissertation. GPA 4.10/4.30.

Master's in Applied Science (MAsc) in [Building Engineering Concordia University](#), 2013-2015.

"Modelling & Experimental Evaluation of an Active Thermal Energy Storage System with Phase-Change Materials for Model-Based Control", supervised by [Andreas K. Athienitis](#) Link: bit.ly/VDermMAScThesis. GPA 4.02/4.30.

Bachelor's in Building Eng. Hon. with Distinction, [Concordia](#), 2007-2011. GPA 3.98/4.30.

Select
Scholarships
and Awards

NSERC Alexander Graham Bell Canada Graduate Scholarship – Doctoral Program ([CGS D3](#)), 2016-2019. \$105'000. Awarded to only 3 students at Concordia; 206 throughout Canada.

Hydro-Québec Entrance Scholarship of Concordia University Faculty of Engineering and Computer Science, 2015-2017. \$33'480.

Concordia Graduate Scholarship in Natural Sciences and Engineering Research ([CGS NSER](#)), 2014-2015. \$17'500.

Select Projects

- + Inventory management system for a multi-site artisanal gelateria.
- + Home air quality monitoring using environmental sensors with an ESP32 sending data via MQTT to Node-RED to process and save in InfluxDB. Grafana dashboard.
- + Guest lecturer, talk titled "Towards large scale deployment of model-based controls" (March 2022); lecture about physics-informed models and model-based predictive controls.
- + Hobby projects: laser cat toy, peanut butter dispenser, solar-powered pyranometer Wi-Fi data logger using an ESP8266; building mechanical keyboards; CNC; 3d design and printing; generative design with Rhino/Grasshopper.

Languages

English (native), French (native), Spanish (basic), German (basic)