# Nicolo Vacis

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## Education

**University of Illinois Chicago** — *Chicago, IL*
Master of Science in Computer Science - Double Degree — *Dec 2026*
*Relevant Coursework: Artificial Neural Networks, Computer Vision, Distributed Systems*

**Politecnico di Milano** — *Milan, Italy*
Master of Science in Computer Science and Engineering - Double Degree — *Dec 2026*

**Politecnico di Milano** — *Milan, Italy*
Bachelor of Science in Computer Science and Engineering — *Jul 2024*
Best Freshman Award
*Relevant Coursework: Algorithms of Computer Science, Networking, Database Systems*

## Experience

**Princeton Vision & Learning Lab** — *Princeton, NJ*
Visiting Research Collaborator — *Jun 2026 - Sep 2026*
- Conduct research on robust 3D scene reconstruction from multi-view images under Prof. Jia Deng, targeting real-world scenarios.
- Design automated pipelines for large-scale generation of synthetic 3D datasets for training robust computer vision models.

**EssilorLuxottica Smart Eyewear Lab** — *Milan, Italy*
Research Engineer — *Jun 2025 - Sep 2025*
- Researched model architecture bottlenecks affecting quantized models on embedded smart glasses, collaborating with **Ray-Ban Meta**.
- Accomplished YOLO Pose quantization performance mitigation, as measured by a 20% AP gain, by applying QAT and distillation in Python.

**BeMyEye** — *Milan, Italy*
Machine Learning Engineer Intern — *Jul 2024 - Oct 2024*
- Built a deep learning hand detection system for camera-based self-checkout, deployed in large scale **Schwarz Group (Europe's #1 retailer)**.
- Designed a U-Net–inspired Scala model to reconstruct feature maps of detected objects, enhancing interpretability with a 9% confidence gain.

**Solarfast** — *Fortaleza, Brazil*
Software Engineer Intern — *Jul 2023 - Sep 2023*
- Integrated backend on AWS (EC2, S3) with Node.js and MongoDB to deploy distributed, parallel microservices enabling real-time monitoring.
- Refactored a modular, event-driven cloud data pipeline for integration with embedded MECT PLC IoT devices using **AWS** ecosystem.

## Research & Projects

**Federated Learning for Glaucoma Detection from Fundus Images** — *Chicago, IL*
*University of Illinois Chicago* — *Oct 2025 - Present*
- Studying domain shift, noise robustness and out-of-distribution behavior using privacy-preserving federated learning.
- Building and benchmarking binary glaucoma classifiers that generalize across sites, improving reliability on real-world ophthalmic data.

**Temporal Action Segmentation for Mouse Behavior Analysis** — *Chicago, IL*
*University of Illinois Chicago - Stanford* — *Sep 2025 - Present*
- Developed a Multi-Stage TCN framework for fine-grained temporal segmentation of mouse scratching behaviors in laboratory video datasets.
- Optimized feature extraction by integrating ResNet and YOLO Pose with a Vision Transformer head, improving frame-level inference accuracy.

**Autonomous Driving - 3D Object Detection for LiDAR Backup** — *Milan, Italy*
*Artificial Intelligence Driving Autonomous - Politecnico di Milano* — *Jan 2025 - Sep 2025*
- Integrated a Camera vision pipeline using Vision Transformer models with OpenCV for 3D detection in autonomous driving.
- Enabled LiDAR backup in long-range detection, raising 3D accuracy on the AIDA dataset for Italy's leading autonomous-driving team sponsored by **FIAT**, **Maserati** and **Cisco**.

## Relevant Competitions

**Hacknation** — *Chicago, IL*
*University of Illinois Chicago* — *Feb 2026*
- Selected participant at Hacknation (MIT–Stanford global AI hackathon); built *Aura*, an AI predictive personal shopping assistant.

## Skills

**Languages:** C, C++, Scala, Python, JavaScript, TypeScript, Java, SQL, C#
**Frameworks & Toolchains (ML):** TensorFlow, PyTorch, scikit-learn, OpenCV
**Frameworks & Toolchains (Software):** React, NodeJS, ASP.NET Core, Hadoop, Spark
**Cloud & Distributed Systems:** AWS, Docker, MongoDB
**Other tools:** MySQL, Git, Linux