Nathan Labiosa
Curriculum Vitae

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EDUCATION

Master of Science - Computer Science   2025–2027
University of Southern California

Bachelor of Science - Biomedical Engineering and Computer Science   2021–2025
University of Wisconsin-Madison
College of Engineering

- AI/ML Principles
- Linear Algebra
- Deep Learning
- Advanced Computer Vision
- Differential Equations
- Circuit Analysis
- Artificial Neural Networks
- Multivariable Calculus
- Probability and Statistics

EXPERIENCE

Machine Learning Intern   2025-2025
Advanced Space

- Built LLM-powered extraction pipelines to extract information from internal documents and scientific literature into structured, relation-based data, improving knowledge representation in a graph database
- Developed a modular MCP tool for graph-based retrieval-augmented generation (RAG), enhancing system accuracy and response quality for complex user queries
- Designed reinforcement learning and inverse reinforcement learning algorithms for multi-object modeling, enabling autonomous agents to infer goals and optimize behavior in spaced-based environments
- Supported in the creation and proposal for a NASA Innovative Advanced Concepts (NIAC) submission, advancing strategic exploration technologies

Computer Vision Researcher   2024-2025
University of Wisconsin-Madison
Advisors: Mohit Gupta and Matthew Dutson

- Stable Neurons: Adapting Frame-Wise Networks for Temporally Consistent Video Inference
- Contributed to a novel framework for temporally stable and corruption-robust video inference, integrating stabilization adapters into frozen vision backbones
- Led the design and evaluation of adversarial robustness experiments, achieving an 11.8% accuracy gain under iterative gradient attacks without retraining base networks
- Engineered stabilizer modules for ResNet architectures, enabling modular, fast-to-train defenses that enhance model resilience to unseen perturbations
- Developed and benchmarked a binary human/nonhuman classification pipeline on the DAVIS dataset using fine-tuned ResNet-50, optimizing training schedules and augmentation protocols

Machine Learning Engineer   2024-2025
Revilico Inc

- Designed and implemented ML pipelines for small molecule drug screening, enabling the validation of eight novel drug activity predictors
- Engineered tools to extract bonding features from SMILES and chemical sequences, supporting prediction of IC50, EC50, and related pharmacodynamic metrics
- Developed custom deep learning architectures to classify drug binding potential to specific receptors, outperforming industry baselines by 15–25%
- Created a reinforcement learning framework for molecular generation, producing novel compounds with optimized properties (e.g., pH, electronegativity, folding patterns)

Visual Large Language Model Researcher   2023-2023
University of Central Florida
Advisors: Sernam Lim and Niels Lobo

- Visual Information and Large Language Models: A Deeper Analysis
- Led collaboration with researchers from the University of Central Florida and Meta, driving forward progress in large language model research
- Refined complex, 65 billion parameter AI models into streamlined, 7 billion parameter university-level models, significantly boosting research applicability
- Designed a visual large language model (VLLM) training using innovative techniques, integrating over 150 thousand images and 160 thousand text examples during multiple training stages

- Attained 95% of industry-leading text-based models using a computer vision-based practical VLLM.
- Utilized Pytorch and Deepspeed frameworks to execute parallel training across 8 GPUs in a high-performance GPU cluster with NVIDIA H100 graphics cards

Quantitative Cell Imaging Researcher 2023-2023
University of Wisconsin-Madison
Department of Biomedical Engineering and Computer Sciences
Advisors: Kevin Eliceri and Vikas Singh
Research Project:

- Constructed novel software tools for tumor micro-environment quantification using deep learning in the LOCI research laboratory, achieving a 95% IOU score compared to leading models
- Achieved an estimated 1.2x faster cell recognition rate weighed against previous techniques

PUBLICATIONS

Adapting Frame-Based Networks for Stable and Robust Video Inference.
Dutson M., **Labiosa, N.**, Li, Y., and Gupta, M.
NeurIPS, 2025. Under Review

Hybrid Transformer Model for Protein Classification.
Labiosa, N., A. Kohli, C. Chung, and C. Korban.
bioRxiv, 2024. doi: 10.1101/2024.10.31.621421

Visual Information and Large Language Models: A Deeper Analysis.
Labiosa, N., Huynh, D., Lim, S.
2023 UCF CRCV Catalog

AWARDS AND HONORS

James Marshall Scholarship 2024

Fred W. & Josephine Colbeck Scholarship 2024

Koch Family Foundation Scholarship 2024

Norman & Marie Ahlswede Endowment Scholarship 2023

IFC Distinguished Brother Scholarship 2022

EXTRACURRICULARS AND LEADERSHIP

Triangle Fraternity 2021-PRESENT
Vice President of Academics:

- Organized academic workshops and held individual tutor sessions
- Led chapter to a top-5 campus GPA
- Orchestrated contact between professors and members

Treasurer:

- Led philanthropic efforts and raised over $2000 for donation
- Taught workshops on financial literacy and fiscal responsibility

PROJECTS

Wireless Pressure Sensor for Braces and Casts 2024-2025
Tong Award for Outstanding Design
- Engineered a Bluetooth-enabled pressure-sensing device integrated into orthopedic casts to prevent pressure ulcers in neuropathic patients, achieving real-time mobile transmission and calibration
- Led all app and bluetooth development

Catch Up With My Committee 2024
2024 Congressional Hackathon Honorable Mention
- Designed an NLP-powered legislative tracking platform to simplify complex bills for younger audiences and foster two-way engagement with Congress.
- Developed user-centric interface prototypes in Figma; presented solution in a pitch competition setting.
- Co-led project, led pitch development

Intraoperative Patient Warming Device   2024

Design Excellence Runner Up

BME 25th Anniversary Poster Presentation Runner Up

- Created an eco-friendly medical device for maintaining patient temperature during surgery, achieving superior heat efficiency and reusability beyond industry standards.
- Led all experimental testing, thermal data collection, and performance validation.

REFERENCES

Niels Lobo
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University of Central Florida
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John Puccinelli
Associate Chair of the BME Undergraduate Program and Associate Teaching Professor
University of Wisconsin-Madison
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Mohit Gupta
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