

Jakub Nowicki

+1 (812) 456-6534 • jjnowicki24@gmail.com • jn214@evansville.edu • jakubnowicki.me • linkedin.com/in/jakub-nowickii •
github.com/JakubNowicki • Evansville, IN / Poznań, Poland

EDUCATION

University of Evansville

Expected May 2027

B.S. in Computer Science and Applied Mathematics (double major)

Evansville, IN

GPA: 3.56 / 4.00. Dean's List: Fall 2023, Fall 2024, Fall 2025.

Relevant Coursework: Machine Learning, Linear Algebra, Databases, Cryptography, Differential Equations, Operating Systems, Computer Architecture, Discrete Mathematics, Probability, Mathematical Statistics, Programming Languages, Introduction to Real Analysis.

RESEARCH INTERESTS

My research interests center on computer vision and reinforcement learning, particularly their application to real-world safety and infrastructure problems, and on fairness and bias in camera-based biometric sensing, such as skin-tone accuracy in remote vital-sign measurement.

PUBLICATIONS

J. Nowicki and M. M. Omwenga, "AI for Traffic Safety: Real-Time YOLO-Based System for Detecting Road Incidents," 2025 IEEE International Conference on Electro Information Technology (eIT), 2025, pp. 1-6. Available:
<https://ieeexplore.ieee.org/document/11103633>

RESEARCH & TECHNICAL PROJECTS

Real-Time YOLO-Based Accident Detection System

January - August 2025

Independent research; published and presented at the 2025 IEEE eIT Conference.

GitHub: github.com/Jakub-Nowicki/IEEE_safety_system_roads

- Built a real-time accident detection desktop application in Python (OpenCV, Tkinter, YOLOv8) supporting image and video input, adjustable confidence thresholds, and automated Excel logging.
- Achieved 98.8% mAP50 and 97.2% mAP50-95 on accident classification after 100 training epochs.

Tools: Python, YOLOv8, OpenCV, Tkinter

rPPG/rBCG Vital-Sign Measurement - Skin-Tone Bias Analysis

September 2026 - Present

Senior capstone research project (CS 495/496), University of Evansville IRB review in progress

- Studying the accuracy gap of camera-based (rPPG/rBCG) vital-sign measurement on darker skin (about 5.2 vs 14.1 bpm error for classical methods in prior work) and testing whether signal fusion or higher-quality cameras narrow it, using VitalVideos-Worldwide (Fitzpatrick I to VI, access pending).
- Secured faculty sponsorship (Prof. M. M. Omwenga) and initiated University of Evansville IRB review for the biometric data-use agreement. Designing a volunteer protocol comparing phone, webcam, and industrial cameras against pulse-oximeter references.
- Built a MediaPipe/OpenCV face-region extraction pipeline running at about 66 fps on one CPU thread on public UBFC-rPPG video, and implemented a lightweight PhysNet-style 3D CNN for pulse-signal estimation.

Tools: Python, PyTorch, OpenCV, MediaPipe, Signal Processing

Reinforcement Learning Traffic Signal Control (SUMO)

March - May 2025

Personal research project

GitHub: github.com/Jakub-Nowicki/sumo_project

- Developed a Q-learning agent with a multi-objective reward (wait time, CO2 emissions, throughput) to optimize traffic signal timing at a two-way intersection using the SUMO-RL framework.
- Reduced average vehicle wait time by 70-80% and CO2 emissions by over 50% versus a static timing baseline across 500 training episodes.

Tools: Python, SUMO-RL, Q-Learning

Reinforcement Learning Agent for Balatro

July - September 2026

Personal project

GitHub: github.com/Jakub-Nowicki/balatro_rm

- Trained a two-stage reinforcement learning agent: first via behavior cloning of a hand-coded strategy, then via reward-based fine-tuning on live gameplay.
- Achieved an approximate 75% win rate against the live game.

Tools: Python, Reinforcement Learning

PROFESSIONAL EXPERIENCE

Software Engineering Intern	June - August 2025
<i>Ruby Care</i>	<i>Berlin, Germany</i>
• Built responsive web interfaces for an AI-powered telehealth platform serving cancer patients and their families. • Shipped patient onboarding and appointment scheduling features connecting users with nutrition, mindfulness, and mental health specialists via secure video consultations. • Built health-tracking and journaling tools enabling patients to log treatment progress and review their medical history.	

Tools: React, TypeScript, REST APIs

SCHOLARSHIPS

International Student Scholarship	2023 - Present
<i>University of Evansville</i>	
Track and Field Athletic Scholarship	2023 - Present
<i>University of Evansville</i>	
Cross Country Athletic Scholarship	2023 - Present
<i>University of Evansville</i>	
Academic Scholarship	2023 - Present
<i>University of Evansville</i>	

LEADERSHIP

NCAA Division I Student-Athlete, Cross Country and Track & Field	May 2023 - Present
<i>Missouri Valley Conference, University of Evansville</i>	
• Competed at the Division I / MVC level while maintaining a full course load, a double major, and a part-time job. • Represented Poland at the national level multiple times, finishing in the top 8 nationally.	

HONORS & AWARDS

- Dean's List, University of Evansville (Fall 2023, Fall 2024, Fall 2025).
- Multiple-time Regional Champion (400m, 800m), Poland.

CERTIFICATIONS

AWS Certified Cloud Practitioner, Amazon Web Services | Issued: September 2026.

TECHNICAL SKILLS

Programming: Python, JavaScript/TypeScript, C++, SQL, HTML/CSS
Machine Learning: TensorFlow, PyTorch, YOLO, OpenCV, MediaPipe, Gymnasium/RL
Web Development: React, Next.js, Flask, REST APIs
Data & Infrastructure: PostgreSQL, NumPy, Pandas, Linux, Git
Research Areas: Reinforcement Learning, Computer Vision

LANGUAGES

Polish (Native), English (C2).