

GABRIEL MATTHEW PAUNICA

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Engineering Student | Software, AI & Automation | Robotics & Product Development | Brussels, Belgium

EDUCATION

- Trinity College Dublin** | B.A.I. Engineering Honours Degree (NFQ Level 8) **2025–2029 expected**
- First-class performance to date across all modules.
 - Relevant modules: Engineering Mathematics, Electronics/Electrical Engineering, Physics, Chemistry, Mechanics, Sustainability, C++ Programming
- British School of Brussels** **Graduated 2025**
- A*A*A – Mathematics, Further Mathematics, Physics.

SELECTED PROJECTS

- FlyBrain – Spiking neural simulation & machine learning** | *Personal AI / neuroscience project* **Sep. 2026 – Present**
- Integrated an 83-neuron olfactory-to-motor subset of the BANC Drosophila connectome into the PyTorch spiking-neural simulator, with reproducible evaluation, neural visualisation and ongoing stability/timing experiments.
 - Trained neural motor readouts using PyTorch autograd and Adam, evaluating learned navigation against matched controls and ablation experiments; achieved 32/32 final target reaches versus 1/32 for fixed and untrained controls in the controlled simulation.
 - Built a closed-loop 2D fly simulation in Python/PyTorch using bilateral odor sensing and a 100-neuron Leaky Integrate-and-Fire spiking neural network to convert sensory activity into movement.
- Agentic dashboard & short-form content automation prototype** | *Personal project* **Dec. 2025 – Jul. 2026**
- Built an autonomous livestream clipping pipeline with n8n, Docker and FFmpeg, using a rolling ~30-second buffer and chat bursts, exclamations, donations and audio spikes to detect high-interest moments.
 - Developed a workflow for event detection, clip extraction, formatting and automated delivery, orchestrating external APIs across the publishing pipeline.
 - Developed an end-to-end Hermes agent workflow using Android Debug Bridge (ADB) control to post clips directly without third-party publishing services.
- Agentic vision-controlled drone** | *Personal AI & robotics project* **Aug. 2026 – Present**
- Developing an autonomous Tello drone integrating computer vision, local LLM reasoning and programmable flight control to translate natural-language goals into structured physical actions.
 - Built a laptop-based control and perception pipeline combining flight commands, live camera streaming, a local computer vision model and real-time people and object tracking.
 - Developing “find object” and “follow target” behaviors with flight limits, manual override and emergency-stop controls for safe autonomous operation.

TECHNICAL SKILLS

Programming | Python, C++, SQL
AI & Machine Learning | PyTorch, Machine Learning, Neural Networks, Spiking Neural Networks, Computer Vision, LLM APIs, supervised learning, imitation learning
Software & Data | APIs, NumPy, data analysis, model evaluation, Git/GitHub, Supabase, Firebase
Simulation & Robotics | Closed-loop control, neural simulation, object tracking, programmable flight control, Pygame
Development & Infrastructure | Docker, FFmpeg, Android Debug Bridge (ADB), VS Code, Cloudflare Tunnels

LEADERSHIP AND ACTIVITIES

- Competitive pianist with concert and Steinway competition experience
- Provided mathematics and physics tutoring, explaining technical ideas clearly and adapting communication to the learner.
- Captain of the school basketball team and youth coach; experienced in teamwork, feedback, leadership and disciplined improvement.

CERTIFICATIONS AND AWARDS

- Anthropic** **April 2026**
- Claude Code, Introduction to Agents, Agent Skills, Claude Code in Action, AI Fluency: Foundations and Frameworks
- Mathematics competitions**
- UKMT Silver Award, 2023 and 2024
 - Purple Comet Mathematics Competition 2024 – 2nd in Belgium
- Miscellaneous**
- Full driving license

LANGUAGES

Fluent | English, French, Romanian
Basic | Spanish