

# Guy Barel

## Student at TU Delft

**Computer Science and Engineering** sophomore undergraduate minoring in **Biochemistry** at **TU Delft**. Experienced in developing **full-stack systems, data science, and machine learning**. Interested in **bioinformatics** and **computational biology** to advance **biogerontology** research.

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## Education

### Delft University of Technology

Bachelor of Computer Science and Engineering | Sep 2024 – Present

- Minor in Biochemistry.

### International Baccalaureate (IB)

Nord Anglia International School Dublin | Sep 2021 – Jun 2024

## Experience

### Systems Biology Ireland, University College Dublin

Research Assistant | Jan 2026 – Present

- Contributing to publications in a **top-5 globally** systems biology institute, advancing the **Digital Twin** for personalized medicine.
- Training neural networks and ODE models in **PyTorch** for drug response prediction across **12 cancer types**.
- Deploying Docker-containerized **scGPT** pipelines with **ScanPy** across **30,000+ gene profiles** for cell-state classification.
- Performing **Western blots** for MAPK/ERK and PI3K/mTOR pathway analysis across inhibitor combinations.

### Meir Eitan MRCS

Computer Technician | Jun 2022 – Aug 2022

- Assembled and repaired **50+ custom-built** computer systems, communicating solutions to clients.
- Performed BIOS configurations, overclocking, data recovery, and hardware diagnostics.

## Projects & Achievements

### iLoveMD

Markdown Processing Web Application | Personal Project

- Built a client-side web application in **TypeScript, Next.js**, and **React** to address gaps in Markdown conversion tooling.
- Integrated Marker for over **96% accuracy** PDF-to-Markdown conversion, tested with **Vitest, jsdom**, and **MSW**.
- Engineered a batch processing pipeline converting **2000+ documents** for **RAG** applications.

### Dynamic Foveated Rendering

Gaze-Contingent Optimization for Ray Tracing | Publication

- Achieved a **71.6% reduction** in ray tracing sampling costs, optimizing BVH traversal via gaze-contingent foveation.
- Derived projective geometry models mapping 3D world space to 2D screen space for adaptive acuity-latency trade off control.

### NetNote

Distributed Note-Taking Application | Course Project

- Built a full-stack collaborative editing desktop application using **JavaFX, Spring Boot, PostgreSQL** and **WebSockets**.
- Served as **Scrum Master** across the development cycle, coordinating feature delivery across a multi-module **Maven** project.

### EMBRYO

TU Delft Impact Contest | Competition

- Designed and prototyped a diagnostic system using ultrasound imagery for early detection of prenatal anomalies.

## Skills & Certificates

- Languages:** Python, Java, C++, JavaScript, HTML/CSS, SQL, Scala.
- Technologies:** NumPy, pandas, Docker, Apache Spark, Node.js, Git, UNIX.
- Certificates:** Cell Biology: Mitochondria – Harvard, Introduction to Biology - The Secret of Life – MIT.

## Volunteering & Interests

- Volunteered at **Wildopvang Haaglanden** as an animal caretaker with over **100 hours** of service.
- Performed at **20+ concerts** as a trumpet player.
- Hobbies:** Piano, Trumpet, Art, Weightlifting.