

Nicholas Dunajski

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linkedin.com/in/nico-dunajski-65b932250 · UK and EU citizen · English (native), Polish (fluent)

RESEARCH INTERESTS

Computational neuroscience: how detailed biophysical models of sensory systems can improve robotic vision, the maths of how habits form and break in neural networks, and how the modern world affects brains that evolved for a different environment.

EDUCATION

BSc Computer Science, University of Sheffield

Sep 2024 – present

First-class marks in Years 1 and 2.

Relevant modules: Bioinspired Computing; Modelling and Simulation of Natural Systems; Reinforcement Learning; Advanced Algorithms; Data Driven Computing; Computer Vision.

Hills Road Sixth Form College, Cambridge

2021 – 2023

A levels: Mathematics, Further Mathematics, Computer Science, Economics; Extended Project Qualification.

RESEARCH EXPERIENCE

SURE Research Project & Bernstein Conference Poster, Centre for Machine Intelligence, Sheffield

Summer 2026

Modelling Evolutionary Mismatch: Information Foraging and Information-Free Novelty.

Supervisor: Prof. James A. R. Marshall.

- Won competitive funding through the Sheffield Undergraduate Research Experience (SURE) scheme.
- Modelled a foraging animal as a single spiking neuron: its membrane potential integrates the scent of nearby patches, and a slower opportunity-cost signal, inspired by the anterior cingulate cortex, builds up on poor patches.
- Mapped fitness over a grid of two heritable traits as novelty shifted from signalling value to carrying no information.
- Simulated in Python on an HPC cluster (SLURM). Code: github.com/nicod2587/evolutionary-mismatch-sure2026
- Presented as a poster at the **Bernstein Conference 2026**, Frankfurt (Sep 2026).

Final-Year Dissertation, University of Sheffield

Oct 2026 – May 2027

Emulating biophysical models in insect vision. Supervisor: Prof. James A. R. Marshall.

- Building a statistical emulator of the Juusola lab's 2022 *Drosophila* photoreceptor model.
- Creating closed-loop photoreceptor microsaccades in the CompoundRay insect-eye renderer to see if it can improve robot vision.

Research Assistant, Juusola Lab (Prof. Mikko Juusola), University of Sheffield

May – Jul 2026

Wet-lab work on complex learning in *Drosophila* larvae

RESEARCH VISITS AND WORKSHOPS

Straw Lab (Prof. Andrew Straw), University of Freiburg

Oct 2026

Learned about the lab's research on honeybee vision and navigation.

Comparative Cognition Lab (Prof. Nicola Clayton), University of Cambridge

Mar 2026

Assisted with experiments using large language models to study prediction errors in cognition.

Attended: NEST Conference 2026; Talk by Dr Christelle Langley, *From Brain Science to Brain Boosting*, University of Cambridge; *Mind the Time* workshop on temporal perception, Sheffield; Fortnightly CMI research meetings.

TEACHING AND POSITIONS OF RESPONSIBILITY

Mathematics and Computer Science Teacher, Hill Point Secondary School, Pokhara, Nepal

Aug – Sep 2026

Taught advanced mathematics to students aged 14 to 16, including the mathematics behind card tricks.

Organiser, Sheffield Wild Swimming Society; Committee Member, Sheffield Surf Society

2025 – 2027

Expedition Staff, Duke of Edinburgh's Award (after completing the Gold Award)

2024 – 2025

Divemaster and Guide, Nitro Dive Centre, Koh Tao, Thailand (student training, guiding clients)

May – Jul 2024

Web Developer for University of Sheffield student societies

Jun 2026 – present

MEMBERSHIPS

Bernstein Network; British Neuroscience Association; London Mathematical Society; NEST Initiative.

REFEREES

Prof. James A. R. Marshall, University of Sheffield · Dr José Miguel Rojas, University of Sheffield