

# Joshua Gilligan

GRADUATE RESEARCHER · DEPARTMENT OF BIOENGINEERING

Stanford University, ETH Zürich

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## Education

### Stanford University

California, USA

#### VISITING RESEARCHER

2024 - Current

- VSR in Possu Huang's Protein Engineering group
- Research focus on vector quantized diffusion models for computational *de novo* protein design
- Wet lab experience in protein production, purification, directed evolution and assays relevant to protein kinetics and binding

### ETH Zürich

Zürich, Switzerland

#### MSC STATISTICS

2022 - Current

- Student researcher within Valentina Boeva's Computational Cancer Genomics groups focusing on AI design of antigen specific antibodies with applications to cancer immunotherapy
- Theoretical classes in Fundamentals of Mathematical Statistics (6), Bayesian Statistics (6) and Statistical Learning Theory (5.75)
- Applied classes in Machine Learning for Genomics (6) and Large Language Modelling (5.5)

### London School of Economics and Political Science

London, UK

#### BSC ACTUARIAL SCIENCE

2019 - 2022

- Graduated First Class with Honours

### Queensland Academy for Science, Mathematics and Technology

Brisbane, Australia

#### INTERNATIONAL BACCALAUREATE DIPLOMA

2016 - 2018

- IB Score 44/45, Summa Cum Laude - top 5% GPA

## Research

**Inferring Binding Specificities of Human Transcription Factors from Multiple Experimental Data Types**, In completion of the IBIS Autosome Challenge, In Review

**Structure Aware Classifier-Free Guided Diffusion for Antibody Design**, Boeva Lab, Department of Informatics, ETH Zürich. Supervised by Dr Valentina Boeva

**Sparse Autoencoder Steering of Small Language Models**, D-GESS, Supervised by Dr. Elliot Ash

**RNN parameterised GARCH models for Volatility Prediction**, Practitioners Challenge, Best Entry Award, Department of Statistics, London School of Economics, 2022

**Functional Graphical Models**, Functional Graphical Lasso Model for EEG Data, RYR Initiative, Department of Statistics, London School of Economics, 2021

**Stability of the FitzHugh-Nagumo Model for Neuron Excitation**, IB Extended Essay, Queensland Academy for Science, Mathematics and Technology, 2018

## Professional Experience

2021 **Capital Markets Internship**, Royal Bank of Canada Capital markets

2020 **Case Summit Spring Week Internship**, Point 72

2019 **VI Data Analytics Intern**, KPMG Australia

2018 **IT and Junior Administrator**, Education Queensland

## Presentations

2017. **Supercomputing Conference**. Presented distributed visualisation project for environmental data, Queensland Academy for Science Mathematics and Technology

## Outreach & Professional Development

### SERVICE AND OUTREACH

2022 - 2023 **Statistics Representative**, Department of Mathematics

ETH Zürich

2019-2022 **Academic Representative**, Department of Statistics

LSE

2019-2022 **Financial Secretary**, LSE Raising and Giving Charity Organisation

LSE

### EXTRA CURRICULAR

**Fencing**, Competitive Member representing Zürich

AFZ

**Chess**, Organising Committee for LSE Chess

LSE

**Private Pilot License (Sailplane Rating)**, Currently pursuing EU LAPL (S) Rating through AFG

Zürich

### LANGUAGES

**English**, Fluent

**Hungarian**, Conversational

**French**, B1

**German**, B1 Undertaking Studies