Arnav Singh

arnavs2ngh@gmail.com • www.linkedin.com/in/arnavs1ngh/ • +44 7490182324 • London, UK

EDUCATION

Imperial College London 2020 - 2024
Master of Science, Mathematics (First Class Honours) *London, UK*

· Focus in Machine Learning, AI, Statistics, and Finance
· Relevant courses: Mathematical Foundations of ML, Optimisation, Statistical Learning, Methods for Data Science, SDEs in Financial Modelling, Intro to Option Pricing, Game Theory, Dynamics of Learning and Iterated Games
· Active Member of Algorithmic Trading Society, Investment Society
· Individual Research Project (97%)

EXPERIENCE & PROJECTS

Curse of Dimensionality in Neural Networks 2023-2024
Research *London, UK*

· Extended work of Poggio et al. to derive new bounds for neural network complexities in discrete function spaces, previously established only for continuous functions, enabling applications and analysis in real-world scenarios such as financial time-series data.
· Executed large-scale experiments on High-Performance Computing clusters, running over 1,500 computational hours, to validate novel self-derived theoretical results, extensively utilising Python, TensorFlow and PyTorch.
· Formulated innovative methodologies for crafting highly efficient neural network architectures, achieving significant reductions in model size—by orders of magnitude—compared to traditional shallow and deep networks, while maintaining or improving accuracy.
· Recognised for Excellence in Applied Maths Research; Invited Speaker at UG Colloquium.

Deep Hedging Models 2023-2024
Research *London, UK*

· Designed and implemented advanced Reinforcement Learning Models for hedging derivatives under Market Frictions, based on previous work of Gonon et. al, seeing up to a 40% decrease in model size while maintaining accuracy compared to traditional models.
· Created models to approximate the super-hedging price and strategy up to maturity of a portfolio of derivatives.

IC Radio 2023-2024
President *London, UK*

· Nominated for Best Society and Most Improved (of 428)
· Premiered guests speakers for live in-person talk shows, including The Economist and world-leading academics.
· Organised 10 sell-out music events throughout the year, with cumulative 8K+ attendees, and record ticket sales, selling out in less than 3 mins. at times.
· Grew a strong and devoted community, seeing 2x membership and 3x increase in active volunteers, from last year.
· Led a tech transformation, upgrading and optimising a large tech stack from legacy systems. Crafted a bespoke website, applets, and APIs for custom studio hardware. Reduced dedicated servers by 50% and FTEs by 3.
· Agile delivery approach resulting in a new portal platform going live in record 8 weeks time. Allowing scalable and automated platform that is future proof and supports composable IT architectures.

Documentary Series 2020-2021
Creator *London, UK*

· Centred around visualising the impact of physical geography on geo-politics around the world, created 3D topographical animations, via a self-made rendering engine using open source NASA height data and maps.
· Collated hundreds of sources and wrote scripts for 10 episodes focused on different geographies.

SKILLS

Languages	Python (TensorFlow, PyTorch, Scikit-Learn, Pandas, SciPy, NumPy), LaTeX, R, Bash, SQL
Web skills	HTML5, CSS, JavaScript (React, Node), Flask, Selenium, Docker
Software	Git, After Effects, Photoshop, Lightroom, Logic Pro X, Final Cut Pro X, Figma
Natural Languages	Hindi (Native), Spanish (B1), Punjabi (Conversational)

INTERESTS

DJ/Music Production Geopolitics Cricket Cycling Film