

# Arvind S. Menon

[Github](#), [LinkedIn](#), [Website](#), [Google Scholar](#), [Devpost](#) || 

## EDUCATION

- **École polytechnique fédérale de Lausanne**, Switzerland *Sept 2022 – Present*  
Master of Science - MSc in Data Science *Grade : 5.6/6.00*
- **Indian Institute of Technology Madras**, India *July 2017 – May 2021*  
Bachelor of Technology in Engineering Physics *Grade : 8.91/10.00*

## PROFESSIONAL EXPERIENCE

- **Garda Capital Partners (Hedge Fund)** *Geneva, Switzerland*  
Quantitative Analyst Intern *Aug 2023 - Jan 2024*
  - Developed a Deep Reinforcement Learning model for portfolio construction using past return, volatility and market context features
  - Used PCA to construct indicators and signals based on concepts of risk aversion and mean reversion to develop ruled-based trading strategies
  - Wrote Python scripts to perform time series forecasting for the US Manufacturing PMI and automated forecast emails and error reports for the same.
- **Adobe** *Bangalore, India*  
Software Engineer 1, Full-time *Jul 2021 - Aug 2022*
  - Role of a software developer in the Adobe Experience Manager Forms workflow team
  - Java web development tasks related to client feature requests, customer-reported issues and testing
- **Adobe Media and Data Science Research Lab** *Noida, India*  
Summer Research Intern *May 2020 - Jul 2020*
  - Worked on a quantum machine learning research project titled “Q-means using variational quantum feature embedding”. Offered a full-time job as a software developer at Adobe post internship.

## RESEARCH PROJECTS

PROJECT REPORT - [REPORT]

- **Predator-Prey simulation using Reinforcement Learning** [[website](#)]  
Course Project, Guide: Prof. Amir Zamir, EPFL *Feb 2023 - Jul 2023*
  - The project investigates predator-prey dynamics through simulated vision and reinforcement Learning and studies emergent behaviours for different vision types.
- **Combinatorial optimization using Deep Reinforcement Learning**  
Semester Project at LIONS, Guide: Dr. Stratis Skoulakis, EPFL *Feb 2023 - Jul 2023*
  - Combine Local search and Deep Reinforcement Learning methods to solve the Maximum Independent Set problem and compare performance with existing SOTA methods
- **Autonomous Lane Changing using Graph Neural Networks** [[report](#)]  
Course Project, Guide: Erik Börve, EPFL *Sep 2022 - Jan 2023*
  - Collaborated with Volvo Labs Sweden as a part of the ML4Science [[link](#)] to study and test the feasibility of using Deep Reinforcement Learning to make fast lane change decisions
- **Online Estimation and Optimization of Shortfall Risk** [[pre-print](#)]  
Guides: Prof L.A. Prashanth & Prof. K. Jagannathan, IIT Madras *Aug 2020 - July 2021*
  - Presented as Bachelor’s Thesis in my Senior year, and awarded the highest grade “S” (10/10)
  - Proposes stochastic approximation-based estimations schemes and stochastic gradient descent based algorithms for Shortfall risk estimation and optimization, and derives non-asymptotic bounds on it’s convergence

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## ARXIV PREPRINT

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- (A1) Menon, A.S., Prashanth, L.A. & Jagannathan, K.P. (2021). **Online Estimation and Optimization of Utility-Based Shortfall Risk**. ArXiv, abs/2111.08805.[[Arxiv](#)]
- (A2) Menon, A.S., Puri N. (2020). **Q-means using variational quantum feature embedding**. ArXiv.[[Arxiv](#)]

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## RELEVANT COURSEWORK

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- **Data Science and Machine Learning:**  
Modern Natural Language Processing , Optimization for Machine Learning, Applied Data Analysis, Visual Intelligence: Machine and Minds, Artificial Neural Networks and Reinforcement Learning, Large Scale Data Science, Virtual Reality, Advanced Topics in Artificial Intelligence
- **Mathematics & Statistics:**  
Information Theory, Causal Inference, Estimation Theory, Applied Statistics, Statistical Physics, Differential Equations, Mathematics of Data: From Theory to Computation
- **Pre-requisites:**  
Data Structures and Algorithms, Applied Linear Algebra, Complex Analysis, Probability

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## ACHIEVEMENTS

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- Received the Best Course Project Award for exemplary performance in the course "Visual Intelligence: Machine and Minds," leading to a sponsored trip to the ICML 2024 conference in Vienna.
- Attained the 2nd place at Lauzhack Hackathon 2022 for the development of a minimum viable product, Q0, providing adaptive open-source content curation services. [[Project Link](#)]
- Awarded a gold medal for achieving an All India Rank of 265 in the 2016 National Science Talent Search Examination.

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## PROGRAMMING SKILLS

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- **Languages:** Python, R, Java, C, SQL, MATLAB, JavaScript, CSS, HTML
- **Data Science Tools:** Plotly, dash, Pytorch, TensorFlow, Apache Spark, BeautifulSoup

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## EXTRA-CURRICULARS & INTERESTS

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- Hackathons**
  - Selected participant at Europe's prestigious HackZurich. Participated in Optiver's trading challenge involving sentiment analysis on tweets and relevant trading on the Optibook platform.
  - Emerged as the winner at Lauzhack 2022 with the project Q0. For more details, refer to my Hackathon Portfolio on [Devpost](#).
- Sports**
  - Represented Maharashtra in India's national level High Jump competition.
  - Represented IIT Madras at InterIIT 2017 in High jump
- Talks**
  - Delivered a webinar addressing prospective students about student life and opportunities as an Engineering Physics student at IIT Madras, organized by a student-run NGO. The talk aimed to foster a supportive student community and promote university prospects. [Watch: [YouTube](#)]