Arvind S. Menon
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EDUCATION

- **École polytechnique fédérale de Lausanne**, Switzerland   *Sept 2022 – Jul 2024*
  Master of Science - MSc in Data Science   Grade : 5.48/6.00

- **Indian Institute of Technology Madras**, India   *July 2017 – May 2021*
  Bachelor of Technology in Engineering Physics   Grade : 8.91/10.00

PROFESSIONAL EXPERIENCE

- **Adobe**   Bangalore, India
  Member of Technical Staff 1, Full-time   *Jul 2021 - Aug 2022*
  ○ Role of a software developer in the Adobe Experience Manager Forms workflow team
  ○ Working on the development of client feature requests, fixing customer-reported issues, and setting up tests using automated testing frameworks

- **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 job offer as a full-time software developer at Adobe.

- **Quantum Cryptography Project, QNu Labs**   Bangalore, India
  Summer Project Intern   *May 2020 - Jul 2020*
  ○ Implemented a secure error correction method for the privacy amplification step in a Quantum Key Distribution system using C and Python

RESEARCH PROJECTS   PROJECT REPORT - [REPORT]

- **Combinatorial optimization using Deep Reinforcement Learning**
  Semester Project at LIONS, Guide: Dr. Stratis Skoulakis   *Feb 2023 - Present*
  ○ 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   *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

- **Q-means using variational quantum feature embedding** [pre-print]
  Guide: Nikaash Puri, Adobe MDSR Lab   *May 2020 - Jul 2020*
  ○ The project theorized a hybrid quantum-classical algorithm to learn a suitable quantum feature map that simplifies complex large datasets, having valid applications in **customer segmentation** and **Cloud-tech** for Adobe products

- **Applications of Deterministic Annealing EM algorithm**[report]
  Course Project, Guide: Prof. Sheetal Kalyani, IIT Madras   *Feb 2020 - May 2020*
  - Furthered the applications of the DA-EM algorithm in Wireless channel estimation for signals with non-Gaussian noise modeled using K-component Gaussian Mixture Models

Arxiv preprint

(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]

Relevant Coursework   O: Ongoing Course

- **Data Science and Machine Learning**:
  Applied Data Analysis, Visual Intelligence: Machine and Minds ^{O}, Machine Learning for Behavioural Data^O, Data Visualization^O, Artificial Neural Networks and Reinforcement Learning ^{O}, Large Scale Data Science for real-world data ^{O}, Pattern Recognition and Machine Learning, Advanced Topics in Artificial Intelligence

- **Mathematics** & **Statistics**:
  Mathematics of Data: From Theory to Computation, Information Theory, Estimation Theory, Applied Statistics, Statistical Physics, Differential Equations

- **Pre-requisites:**
  Data Structures and Algorithms, Applied Linear Algebra, Complex Analysis, Probability

Achievements

- Secured 2nd place at Lauzhack Hackathon 2022 where we created a minimum viable product Q0 [link] that provides adaptive open-source content curation services

- Awarded a gold medal for securing an All India Rank of 265 in the 2016 National Science Talent Search Examination

Programming Skills

- **Languages**: Python, Java, C, C++, R, SQL, MATLAB, JavaScript, CSS, HTML

- **Data Science Tools**: Pytorch, TensorFlow, Apache Spark, Hadoop, BeautifulSoup

Extra-curriculars & Interests

Sports
- Represented IIT Madras at InterIIT 2017 in High jump
- Part of the Institute Football Team at Chennai Sportfest 2019
- Captain of Department Football team and Hostel Athletics team .

Talks Gave a talk about student life and opportunities as an Engineering physics student at IIT Madras, on a **Webinar conducted by Tensors (student run NGO)** to facilitate prospective students and promote a friendly student community.[youtube]