

Arul Murugan

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EDUCATION

UC Berkeley

Masters in Information Management and Systems

Berkeley, CA

Aug. 2025 – Present

BITS Pilani

Bachelor of Engineering in Chemical Engineering

Goa, India

Aug. 2018 – May 2022

- Earned a First Division Degree
- Recipient of Merit-Cum Need Scholarship
- Student-Faculty Committee Representative

WORKING PAPERS

- * Tranchero, M., Brenninkmeijer, C. F., **Murugan, A.**, & Nagaraj, A. (2024). Theorizing with Large Language Models (No. w33033). National Bureau of Economic Research.

ACADEMIC COURSES

Foundations for Beneficial AI, Applied Natural Language Processing, Game Theory and its Applications, Intro to Cognitive Neuroscience, and Intro to Algorithms and Analysis

EXPERIENCE

Research Fellow

Jul. 2024 – Aug. 2025

Data Innovation Lab, UC Berkeley

California, USA

- * Implemented AI Agent Simulations: Designed and coded a complex multi-agent simulation workflow to study the "streetlight effect," including defining game rules, agent action spaces, environments, and rewards; ran experiments and validated results that aligned with human behavior, **enabling novel extensions**
- * Developed a No-Code Simulation Platform: Built a Generative AI-powered no-code platform for researchers, simplifying the process of designing and running multi-agent simulations for diverse experimental scenarios
- * Leveraged Language Models for Large-Scale Data Processing: Automated the extraction and processing of 50,000 complex biological pathway images using language models, implementing parallelized workflows on the cloud via SSH to handle large-scale data efficiently; performed data cleaning, transformation, and pre-processing to prepare the datasets for downstream analysis, facilitating the study of theoretical influences on innovation
- * Applied Econometric Analysis: Initiated econometric modeling of large datasets derived from biological pathway analyses, contributing to a deeper understanding of innovation dynamics
- * Investigating Mechanistic Interpretability of LLMs: Currently leveraging Sparse Auto-Encoders (SAE) to analyze the internal mechanisms of large language models (LLMs), focusing on feature steering within model internals; comparing results with traditional prompting and fine-tuning methods to better understand model behavior and evaluate effectiveness

Founding Engineer

May. 2022 – Jun. 2024

Photon Insights, Inc.

Pennsylvania, USA

- * Helped rapidly build the MVP along with the founder, which was used to raise funding of **\$2mn**
- * Information Retrieval: Engineered advanced web and social media scrapers, optimizing data processing
- * Backend: Developed API endpoints using FastAPI, built server-less applications and deployed on AWS Lambda
- * Analytics: Leveraged MixPanel and Metabase to obtain App Statistics and mitigate customer pain points; also performed case studies using the Photon tool for early warning detection
- * Machine Learning: Evaluated state-of-the-art models to develop an optimal ensemble for sentiment detection and summarization; worked with embeddings and vector databases to create LLM-based applications and curated high-quality diverse datasets for custom model fine-tuning
- * Photon Insights is an AI-driven platform that provides valuable insights from large sets of unstructured data, helping businesses make data-driven decisions with confidence

Research Intern

Jan. 2022 – Apr. 2022

Woodstock Fund

Dubai, UAE

- * Researched various dynamics in the crypto space with a focus on the Decentralized Finance protocols
- * Meticulously vetted and leveraged grants, hackathons, and accelerator programs to find early-stage companies as per the fund's thesis and built a network of over **50** sources
- * Connected with **10+** prospective investments and entrepreneurs on calls, carried out extensive due diligence on their product, business plan, go-to-market strategy, token economics, team, and competitive position
- * Woodstock is an Emerging Technology Investment Firm; it invests in early and growth stage Web3.0 companies

Associate Product Manager Intern

Jul. 2021 – Dec. 2021

BrightCHAMPS

Bangalore, India

- * Worked on various automation projects to streamline operations and product delivery, including webpage scraping, data extraction from Instagram, and Certificate generation, cutting down 20+ hours/week cumulatively
- * Increased the demo completion and overall conversion rate by 17% by reducing the friction points
- * BrightChamps is a global ed-tech company that provides classes on coding, and robotics to children

Queen Mary University of London

May. 2021 – Jul. 2021

Research Intern

London, UK

- * Collaborated with Dr. Vimal Balasubramaniam to enhance an R statistical package for finance and econometrics event study analysis, integrating machine learning algorithms to boost modeling accuracy and efficiency
- * Developed an R script for analyzing NIFTY50 data, optimizing calculations of abnormal returns

WorldQuant LLC

Feb. 2019 – Oct. 2019

Research Consultant

Mumbai, India

- * Implemented research papers into trading strategies using diverse datasets, which were utilized by fund managers
- * Designed High-Sharpe, robust, and unique long-short equity models by using statistical arbitrage modeling; back-tested on historical data of 10 years
- * WorldQuant is an international hedge fund and quantitative investment management firm

POSITIONS OF RESPONSIBILITY

BITS Goa Consulting Club

BITS Pilani, Goa

Partner - Business Studies

May 2020 – Apr 2021

- * Co-founded Consulting Club; led initiatives like Guest Lectures and Problem-Solving Tests for **60** of my peers
- * Partnered with IIM Calcutta and IIM Lucknow Consulting Clubs for live projects and knowledge sharing
- * Taught Strategy Consulting and Business Analytics course as an instructor for the Center for Technical Education

COMPETITIONS

Alpha Quality Program, July 2019

- * Achieved a Global rank of **11th** and National rank of **2nd** in Alpha Quality Program
- * The AQP is a highly competitive event conducted by WorldQuant LLC, involving research consultants globally. Participants are required to submit an in-depth report detailing their most effective alpha model in quantitative finance

EXTRA-CURRICULAR ACTIVITIES

Swimming

- * Engaged in competitive swimming for seven years, represented my district in prestigious competitions such as the Tamil Nadu state meets and Chief Minister's Trophy
- * Accomplishments: Secured several State-Level, Regional-Level, and District-Level medals, highlighting a consistent record of exceptional performance across various competitions

TECHNICAL SKILLS

Languages: Python, C/C++, SQL (MySQL), R

Frameworks: EDSL, Flask, FastAPI, SpaCy, NLTK

Tools: Git, Docker, AWS, MixPanel, Metabase, Postman

LLMs: OpenAI, LLama, Mistral, HuggingFace