# Karthikeyan Shanmugam

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## EDUCATION

**New York University (NYU)**
Masters in Computer Science | Courant Institute of Mathematical Sciences | Sept 2022 - May 2024 (Expected)
- Teaching Assistant for Math Finance Python Bootcamp
- Relevant Coursework: Fundamental Algorithms, Artificial Intelligence, Computer Vision, Cloud & Machine Learning, Data Science for Business, Realtime & Big Data Analytics, Multicore Processors: Architecture & Programming

**Stanford University**
NUS Overseas Colleges (NOC) Entrepreneurship Programme | Aug 2015 – July 2016
- Masters Courses in Management Science & Engineering and Entrepreneurship

**National University of Singapore (NUS)**
Industrial and Systems Engineering | Bachelor of Engineering, Honours (Distinction) | Aug 2013 - Dec 2017
- University Scholars Programme (Multidisciplinary Academic Honors College Programme)

## SKILLS

**Languages**: Python, SQL, Java, C++, C, SwiftUI
**ML / DL**: PyTorch, TensorFlow, Keras, Scikit-Learn
**LLMs**: LangChain, ReAct framework, OpenAI GPT
**Cloud**: Docker, Kubernetes, AWS, GCP
**Others**: NumPy, Pandas, Apache (Kafka, Hadoop, Hive), Flask, MATLAB, OpenMP, Agile/Scrum, DevOps, Design Thinking

## EXPERIENCE

**J.P. Morgan |** Software Engineer (Associate), Trade Surveillance | Jan 2020 – Jun 2022 | Singapore
- Incorporated trade compliance user requirements to detection engines (Java & SQL) improving the engines' capabilities in flagging non-compliant trading activities by > 20%, a key regulatory requirement for the bank
- Designed and built data pipeline (Python, Kafka & SQL) to enrich trade data, resulting in 10% reduction in false positive alerts
- Led migration of over 20 team-owned applications on Athena, the bank's internal platform, from Python 2 to Python 3

**J.P. Morgan |** Software Engineer (Analyst), Infrastructure - Middleware | Feb 2018 – Jan 2020 | Singapore
- Built microservices to automate web server patching (Python & Ansible), minimizing manual work by > 30%
- Developed application (Python) to generate usage reports of microservices to aid management in strategic decisions
- Managed and resolved incidents involving microservices through root cause analysis and proactive user communication

**J.P. Morgan |** Technology Summer Analyst (Intern), Infrastructure - Storage | May 2017 – Jul 2017 | Singapore
- Built real-time interactive dashboard (QlikView) for the APAC storage team to manage its inventory utilization

**Percolata |** Product Management Intern | Aug 2015 – Jul 2016 | Palo Alto, USA
- Drove development of scheduling solution by liaising with 3 clients in the US and the engineering team in China
- Automated operational processes like report generation (Python, SQL & Tableau), reducing manual work by > 50%

**Centre of Innovation for Supply Chain Management** | Software Engineering Intern | May 2015 – Jul 2015 | Singapore
- Built web application (Python) for small-sized manufacturing clients to streamline production planning and scheduling
- Created business model for web application and validated it with potential clients as part of startup pre-accelerator program

## PROJECTS

**Music Generation using Long Short-Term Memory (LSTM) Network** | New York, 2024
- Developed and trained custom LSTM network (TensorFlow, Keras, NumPy & Pandas) on piano MIDI files to generate music

**LinkedIn Ice Breaker App using LangChain and Large Language Models (LLMs)** | New York, 2024
- Developed web application (Flask) using LangChain (ReAct Agent framework) and OpenAI's GPT-3.5-Turbo LLM to generate tailored ice breakers from data scraped from LinkedIn profiles (SerpApi & Proxycurl API)

**Gunshot Detection using Convolutional Neural Networks (CNN)** | NYU | New York, 2023
- Developed and evaluated computer vision architectures (PyTorch) - custom CNN, ResNet18, custom dual-headed EfficentNetV2 and VisionTransformer - to detect gunshot sounds in urban environments using audio spectrograms

**MindAId** | NYU Entrepreneurial Institute - Startup Accelerator Program (Bootcamp) | New York, 2023
- Startup venture: Generative AI-based virtual companion to support early-stage Alzheimer's patients
- Used Lean Startup and Design Thinking approach to actively engage in customer discovery through interviews

**AppEase - Apple Watch Based Solution for Children with ADHD** | NYU | New York, 2023
- Developed WatchOS and iOS Application (SwiftUI) features to help children better manage their stress, anxiety and behavior
- Built data storage pipeline (Python, Kafka & InfluxDB) to store health data for improving stress detection ML models

**Text Analysis of Resolution Notes** | J.P. Morgan, Trade Surveillance | Singapore, 2021-22
- Used natural language processing techniques (Python) to identify causes of false positive trade surveillance alerts