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Anand Nagar, Krishnankoil - 626126, Srivilliputtur (via), Virudhunagar District, Tamilnadu.

# APPLICATION FOR ADMISSION TO Ph.D. PROGRAMMES

Date of Application:08-09-2025

| | | | |
|---|---|---|---|
| Department | COMPUTER APPLICATIONS | Application No. | 2025010402 |
| Area of Research | DATA ENGINEERING AND SCIENCE | Research Mode | PART TIME |

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| Degree | Discipline | College/university | Year Passed | AVG/CGPA | Class | Mode |
|---|---|---|---|---|---|---|
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| BSC | ELECTRONICS | BANGALORE UNIVERSITY | 2003 | 52% | 2ND CLASS | REGULAR |

Experience

| Organization | Designation | Experience From | Experience TO | Work Nature |
|---|---|---|---|---|
| DATAVANT INC | SENIOR MANAGER | 2025-01-01 | 1970-01-01 | SOFTWARE ENGINEERING |
| APIXIO | SENIOR MANAGER | 2019-08-24 | 2024-12-31 | SOFTWARE ENGINEERING |
| COGNIZANT | MANAGER | 2013-01-30 | 2019-08-22 | SOFTWARE ENGINEERING |

| Payment Details | | | | |
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| Transaction ID | Reference | Date of transaction | Amount | Status |
| 2025010402_250908070517 | BHD5PZ30VJTQWG | 08-09-2025 | 600 | SUCCESS |

# Research Proposal

### Designing Scalable Architectures for Cybersecurity Data Analytics

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## Introduction

The modern cybersecurity landscape is marked by an unprecedented influx of data from diverse sources, including network traffic, system logs, and user behavior. As this data continues to grow in volume, velocity, and variety, traditional security infrastructures are struggling to keep up—leading to delayed threat detection and inadequate response capabilities. This underscores a critical need for scalable, resilient architectures that can handle real-time data ingestion and advanced analytics effectively.

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## Problem Statement

Many current cybersecurity solutions fall short in terms of scalability, speed, and adaptability. Conventional architectures are not built to process massive, heterogeneous datasets in real-time, resulting in performance bottlenecks and missed threats. Furthermore, a lack of integration between diverse data sources hampers the ability of analytics engines to generate actionable insights. This research proposes to address these limitations by designing a scalable, modular architecture powered by advanced data engineering and data science methodologies tailored for cybersecurity.

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## Research Objectives

1. **Develop a Scalable Architecture**
   Design a system capable of efficiently ingesting, storing, and processing high volumes of streaming and historical cybersecurity data.

2. **Enable Seamless Data Integration**
   Build mechanisms to integrate structured, semi-structured, and unstructured data from disparate sources, ensuring data consistency and reliability.

3. **Enhance Analytical Capabilities**
   Apply machine learning and AI-driven methods to improve real-time threat detection, anomaly identification, and predictive analysis.

4. **Evaluate System Performance**
Conduct comprehensive benchmarking to assess scalability, latency, throughput, and overall efficiency under varying data loads and use cases.

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# Preliminary Analysis

A survey of existing literature reveals that most cybersecurity architectures lack the ability to scale efficiently while supporting real-time analytics. Although several big data frameworks (e.g., Apache Spark, Flink) offer strong processing capabilities, they are often underutilized in security-focused implementations. Early investigations into modern data platforms and ML toolkits suggest a promising foundation upon which scalable, AI-enhanced cybersecurity systems can be built. These insights form the basis of this research's direction and design.

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# Methodology

## Architecture Design & Data Integration

- **Microservices Architecture**: Employ a modular, loosely coupled microservices framework to ensure easy scalability, maintainability, and deployment flexibility.

- **Data Lake Implementation**: Utilize a data lake architecture to ingest and store varied data formats for ETL/ELT processes, supporting both batch and real-time workflows.

- **Stream Processing & Real-Time Ingestion**: Integrate streaming technologies (e.g., Apache Kafka, Databricks Structured Streaming) for continuous data processing. Leverage webhooks, APIs, and AI-driven pipelines for dynamic data integration.

## Implementation & Performance Evaluation

- **Machine Learning for Threat Analytics**: Develop and train ML models for anomaly detection and behavioral analysis to proactively identify threats.

- **Visualization & Insight Delivery**: Incorporate modern visualization tools (e.g., Grafana, Kibana, Power BI) for clear, interactive dashboards.

- **Stress Testing & Benchmarking**: Test the architecture under various data loads to measure latency, scalability, and processing speed across components.

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# Conclusion

This research aims to contribute a robust, scalable architectural framework that addresses current limitations in cybersecurity data analytics. By integrating advanced data engineering techniques with AI-driven analytics, the proposed solution seeks to significantly enhance the speed, accuracy, and reliability of threat detection systems. Ultimately, this work strives to empower cybersecurity professionals with tools that are capable of adapting to the ever-evolving threat landscape in real-time.

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*the members of the Syndicate & Academic Council*

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**Mahesh Kumar S** .....ಅವರು

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**Master of Computer Applications**

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*in recognition of the fulfilment of requirements*

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*for the said degree as indicated below*

ಪರೀಕ್ಷೆಯ ವರ್ಷ: July 2006

*Year of Examination:*

ಪಡೆದ ವರ್ಗ : First

*Class:*

ವಿಶ್ವವಿದ್ಯಾಲಯದ ಅಧಿಕಾರ ಮುದ್ರೆಯೊಡನೆ ನೀಡಲಾಗಿದೆ

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*Bangalore:*

ದಿನಾಂಕ 29.08.2007
*Date:*

DATE OF ISSUE :
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HARangan.I
ಕುಲಪತಿ
*Vice-Chancellor*

62

| | NAME AND DESIGNATION | SIGNATURE | DATE |
|---|---|---|---|
| ..TRY FOKED BY | B. SURESH Jr. Asst. | B. Suresh | 7.11.07 |
| D BY | B. Vishwanath Supdt. | | 8.11.07 |
| | ANTHONY DEVAR Deputy Registrar (A) | | 9.11.07 |

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No - Annexure I

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*has been duly admitted to the Degree of*

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| D BY | B. Vishwanath Supdt. | | 8.11.07 |
| | ANTHONY DEVAR Deputy Registrar (A) | | 9.11.07 |

datavant

12/03/2024
Mahesh Kumar Sivaraj
msivaraj@apixio.com/mahesh.kumarsivaraj@datavant.com

Dear Mahesh,

**Welcome to Datavant!**

Congratulations on joining our team! We are excited to have you as part of our mission to transform healthcare by securely connecting data. At Datavant, you will play a vital role in helping organizations move and integrate data safely, driving impactful change across the industry.

We're thrilled to have you on board and look forward to the contributions you will make. Welcome to the team!

**Position Details:**

- **Position**: Senior Manager, Data Integration
- **Reporting to**: Venky Kumar, Senior Director, Data Engineering
- **Start Date**: January 1, 2025
- **Work Setting**: Remote
- **Employing Entity**: You will be an employee of Ciox Health, LLC, doing business as Datavant Group.
- **Employment Status**: This is a full-time regular employee role.

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**Benefits**:

- As this role is full-time, you will be eligible to participate in the benefits offered by Datavant under the terms and conditions of each plan. The details of our benefits will be sent during onboarding. You must enroll in benefits within 30 days of your start date and your benefits will be prorated for a January 1, 2025 start.
- Datavant has a Flexible Paid Time Off (PTO) for exempt employees. This policy provides exempt associates with the capability to balance their personal and work lives while still continuing to take care of our business needs.

**Conditions of Employment:**

This offer is contingent upon agreement to our standard employee confidentiality, restrictive covenant and non-disclosure agreement, and presentation of evidence of your authorization to work in the United States. In accordance with any applicable client requirements, you may be required to successfully complete a background check and other physical occupational screenings as a condition of employment.

Of course, your employment with Datavant will be subject to your compliance with all Datavant policies and procedures applicable to your position.

You represent that accepting this position will not cause you to violate any contract or agreement that you have with any current or prior employer, or to violate the confidentiality or trust of any relationship you have or had. If this is not the case, please let us know immediately.

This letter reflects the entire understanding and agreement between you and Datavant as to this offer of employment and supersedes all prior discussions, understandings and agreements of any kind between you and Datavant as to the subject matter. By signing this agreement, you acknowledge that you will follow the procedures and policies to ensure safe use and access of all Datavant tools, systems, and data assets.



E67325D6-BF1F-43B4-807F-650EFD6AA7FD Sincerely,

Susan Yun
Chief People Officer

---

Accepted and Agreed,
Signature:

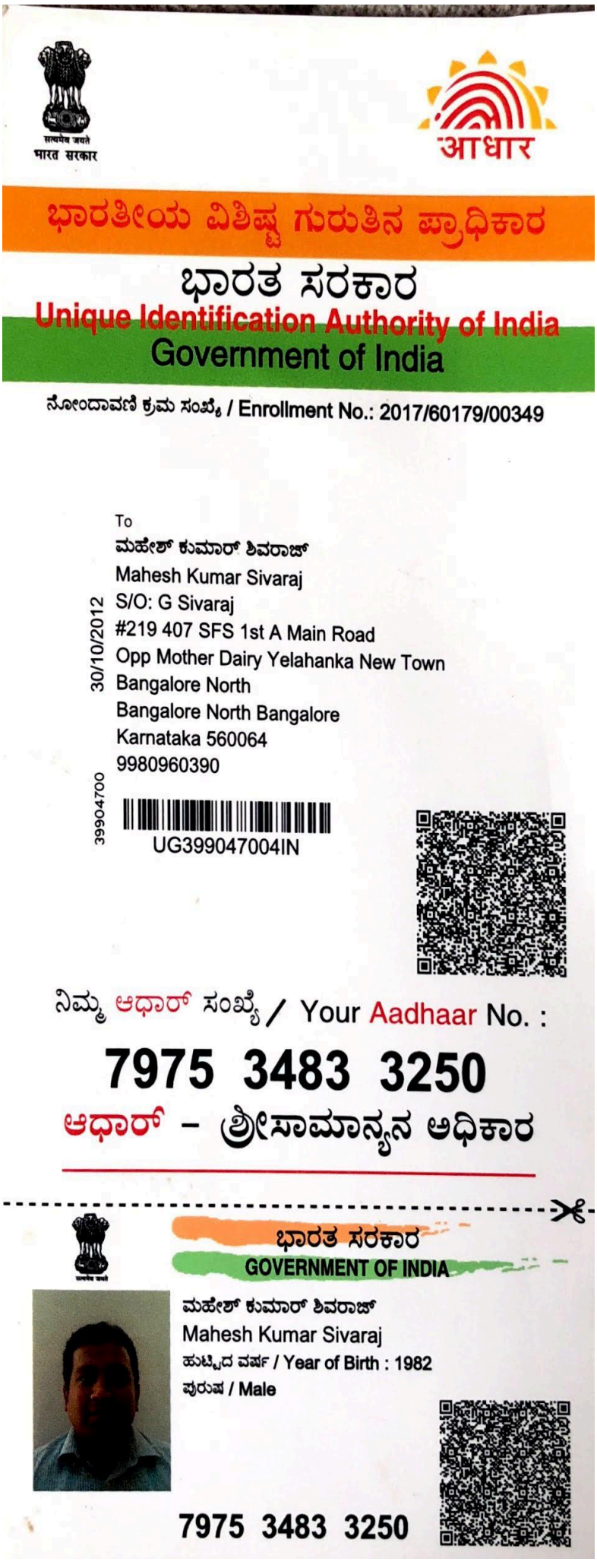
Full Name:

Mahesh Kumar Sivaraj

12/4/2024

Date:

When you agree to become a full employee of Datavant, Apixio will transfer your employee file to Datavant. Some personal data from your file will be loaded into Oracle to enable easy access to People Team tools and services. For more information on how Datavant protects personal data like that in your employee file, please review Datavant's online Privacy Policy. If you have any questions about Datavant's privacy practices, please contact dataprivacy@datavant.com.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7975 3483 3250
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ಭಾರತ ಸರಕಾರ
GOVERNMENT OF INDIA
ಮಹೇಶ್ ಕುಮಾರ್ ಶಿವರಾಜ್
Mahesh Kumar Sivaraj
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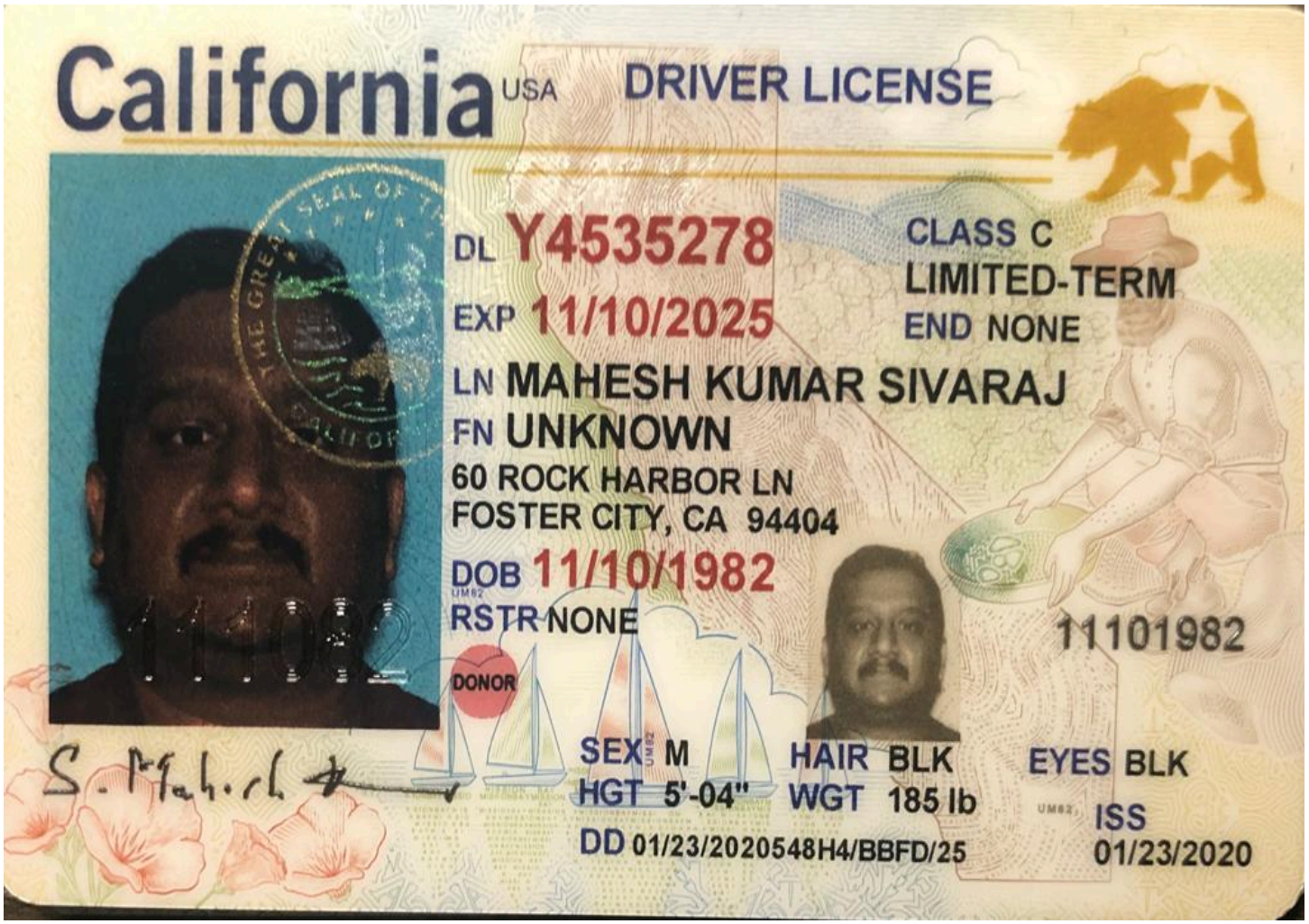
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WGT 185 lb
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