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(71)Name of Applicant :
  1)Mr. R. Sivasankar
    Address of Applicant :Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108 ----------- -----------
  2)Dr. M Marikkannan
  3)Mrs. Pathivada Monika
  4)Murali Mohan Vutukuru
  5)Dr. P.Malathi
  6)Nithya Nandhakumar
  7)Dr. C. R. Rene Robin
Name of Applicant : NA
Address of Applicant : NA
(72)Name of Inventor :
  1)Mr. R. Sivasankar
Address of Applicant :Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108 ----------- ----------
  2)Dr. M Marikkannan
Address of Applicant :Senior Assistant Professor, Department of Computer Science and Engineering, Government College of Engineering, Sri Vasavi College, Post Erode - 638316 ----------- -----------
  3)Mrs. Pathivada Monika
Address of Applicant :Assistant Professor, Department of Computer Science and Engineering, Avanthi Institute of Engineering and Technology, Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist.), 531162 ----------- ------------
  4)Murali Mohan Vutukuru
Address of Applicant :Associate Professor, Department of Computer Science and Engineering, Green Fields, Vaddeswaram, Guntur District, 520002 ----------- -----------
  5)Dr. P.Malathi
Address of Applicant :Associate Professor, Saveetha College of Liberal Arts and Sciences, Saveetha Institute of Medical and Technical Sciences, Saveetha Nagar, Thandalam, Chennai-602105 ----------- -----------
  6)Nithya Nandhakumar
Address of Applicant :Assistant Professor, Department of Computer Science and Engineering, K.Ramakrishnan College of Engineering, Trichy-621112 ----------- -----------
  7)Dr. C. R. Rene Robin
Address of Applicant :Professor & Dean (Innovation), Department of Computer Science and Engineering, Sri Sairam Engineering College, West Tambaram, Chennai, Tamil Nadu 600044 ----------- -----------

(57) Abstract :
The invention introduces an intelligent task scheduler tailored for machine learning workloads in cloud computing environments. Leveraging advanced algorithms and machine learning principles, the system dynamically allocates resources based on real-time demands, optimizing performance and minimizing latency. It adapts to variations in workload patterns, data characteristics, and the dynamic availability of cloud resources, ensuring an adaptive and efficient scheduling process. The system further addresses challenges in multi-tenant cloud environments, orchestrating fair and optimal resource allocation among competing machine learning workloads. Positioned as a future-proof solution, the invention evolves alongside technological advancements, contributing to the seamless integration of machine learning and cloud computing. With a departure from traditional static methodologies, the system serves as a linchpin for diverse machine learning applications, redefining the landscape of computational intelligence in the digital age. Accompanied Drawing [FIGS. 1-2]

No. of Pages : 23 No. of Claims : 10

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)		(FOR OFFICE USE ONLY)
	Application No.	
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1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)	

2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]

Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )

3A. APPLICANT(S)

Name in Full	Nationality	Country of Residence	Address of the Applicant
1. Mr. R. Sivasankar	Indian	India	Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108
2. Dr. M Marikkannan	Indian	India	Senior Assistant Professor, Department of Computer Science and Engineering, Government College of Engineering, Sri Vasavi College, Post Erode - 638316
3. Mrs. Pathivada Monika	Indian	India	Assistant Professor, Department of Computer Science and Engineering, Avanthi Institute of Engineering and Technology, Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist.), 531162

4. Murali Mohan Vutukuru	Indian	India	Associate Professor, Department of Computer Science and Engineering, Green Fields, Vaddeswaram, Guntur District, 520002
5. Dr. P.Malathi	Indian	India	Associate Professor, Saveetha College of Liberal Arts and Sciences, Saveetha Institute of Medical and Technical Sciences, Saveetha Nagar, Thandalam, Chennai-602105
6. Nithya Nandhakumar	Indian	India	Assistant Professor, Department of Computer Science and Engineering, K.Ramakrishnan College of Engineering, Trichy-621112
7. Dr. C. R. Rene Robin	Indian	India	Professor & Dean (Innovation), Department of Computer Science and Engineering, Sri Sairam Engineering College, West Tambaram, Chennai, Tamil Nadu 600044

3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]

Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup ()	Others ()

4. INVENTOR(S) [Please tick (✓) at the appropriate category]

Are all the inventor(s) same as the applicant(s) named above?	Yes (✓)		No ()

If "No", furnish the details of the inventor(s)

Name in Full	Nationality	Country of Residence	Address of the Inventor
Same as Applicant			

5. TITLE OF THE INVENTION

"OPTIMIZING MACHINE LEARNING WORKLOAD TASK SCHEDULING IN CLOUD ENVIRONMENTS"

6. AUTHORISED REGISTERED PATENT AGENT(S)	IN/PA No.	
	Name	
	Mobile No.	

7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	Mr. R. Sivasankar
	Postal Address	Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam

				Taluk, Tirupur District, 638108
		Telephone No.		
		Mobile No.		9942049301
		Fax No.		
		E-mail ID		ersivashankar@gmail.com

8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION
COUNTRY, PARTICULARS OF CONVENTION APPLICATION

Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in the convention country)

9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)

International application number	International filing date

10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF
ORIGINAL (FIRST) APPLICATION

Original (first) application No.	Date of filing of original (first) application

11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN
APPLICATION OR PATENT

Main application/patent No.	Date of filing of main application

12. DECLARATIONS

(i) Declaration by the inventor(s)

(**In case the applicant is an assignee**: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).

I/We, the above named inventor(s) is/are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.

(a) Date 02/02/2024

(b) Name	(c) Signature
1. Mr. R. Sivasankar 2. Dr. M Marikkannan 3. Mrs. Pathivada Monika 4. Murali Mohan Vutukuru	R.Siva M.A P. Monika

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5. Dr. P.Malathi 6. Nithya Nandhakumar 7. Dr. C. R. Rene Robin	*V. Mati* *P.* *N. Nithy*

(ii) Declaration by the applicant(s) in the convention country

~~**(In case the applicant in India is different than the applicant in the convention country:** the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period)~~

~~I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.~~
~~(a) Date~~
~~(b) Signature(s)~~
(c) ~~Name(s) of the signatory~~

(iii) Declaration by the applicant(s)

I/We the applicant(s) hereby declare(s) that: -

- ☐ ~~I am/~~ We are in possession of the above-mentioned invention.
- ☐ The ~~provisional~~/complete specification relating to the invention is filed with this application.
- ☐ ~~The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.~~
- ☐ There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- ☐ ~~I am/~~we are the true & first inventor(s).
- ☐ ~~I am/we are the assignee or legal representative of true & first inventor(s).~~
- ☐ ~~The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).~~
- ☐ ~~I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.~~
- ☐ ~~My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.~~
- ☐ ~~The application is divided out of my /our application particulars of which is given inParagraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.~~
- ☐ The said invention is an improvement in or modification of the invention

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	particulars of which are given in Paragraph-11.		

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form 2

Item	Details	Fee	Remarks
Complete/ ~~Provisional~~ specification) #	No. of pages: 18		
No. of Claim(s)	No. of claims: 10 No. of pages: 02		
Abstract	No. of pages: 01		
No. of Drawing(s)	No. of drawings: 02 No. of pages: 02		

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are
required to be mentioned here.

(b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

(c) Sequence listing in electronic form

(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).

(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.

(f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.

(g) Statement and Undertaking on Form 3

(h) Declaration of Inventorship on Form 5

(i) Power of Authority

(j) **Total fee ₹………in Cash/ Banker's Cheque /Bank Draft bearing No..........
Date on …………. Bank.**

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this 2nd day of February 2024

Signature: R. Sivsar

Name: Mr. R. Sivasankar et. al.

To,

The Controller of Patents

The Patent Office, at Chennai

Note: -

* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick ()/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.
* For fee: See First Schedule";

COMPLETE SPECIFICATION

(See section 10 and rule 13)

TITLE OF THE INVENTION

"OPTIMIZING MACHINE LEARNING WORKLOAD TASK SCHEDULING IN

CLOUD ENVIRONMENTS"

Applicant(s)

NAME	NATIONALITY	ADDRESS
1. Mr. R. Sivasankar	Indian	Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108
2. Dr. M Marikkannan	Indian	Senior Assistant Professor, Department of Computer Science and Engineering, Government College of Engineering, Sri Vasavi College, Post Erode - 638316
3. Mrs. Pathivada Monika	Indian	Assistant Professor, Department of Computer Science and Engineering, Avanthi Institute of Engineering and Technology, Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist.), 531162
4. Murali Mohan Vutukuru	Indian	Associate Professor, Department of Computer Science and Engineering, Green Fields, Vaddeswaram,

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		Guntur District, 520002
5. Dr. P.Malathi	Indian	Associate Professor, Saveetha College of Liberal Arts and Sciences, Saveetha Institute of Medical and Technical Sciences, Saveetha Nagar, Thandalam, Chennai-602105
6. Nithya Nandhakumar	Indian	Assistant Professor, Department of Computer Science and Engineering, K.Ramakrishnan College of Engineering, Trichy-621112
7. Dr. C. R. Rene Robin	Indian	Professor & Dean (Innovation), Department of Computer Science and Engineering, Sri Sairam Engineering College, West Tambaram, Chennai, Tamil Nadu 600044

The following specification particularly describes the nature of the invention and the

manner in which it is performed:

FIELD OF THE INVENTION

[001] The proposed system operates at the intersection of cloud computing and machine learning, focusing on the dynamic and efficient scheduling of tasks within machine learning workloads.

[002] By delving into the field of task scheduling, it addresses the challenges posed by the intricate nature of machine learning algorithms and their resource-intensive computations. This innovation seeks to optimize the allocation and utilization of cloud resources, ensuring seamless execution of machine learning tasks. The system leverages advanced algorithms and intelligent decision-making processes to dynamically assign tasks to available computing resources, thereby enhancing overall performance and reducing processing times.

[003] With a keen emphasis on scalability and adaptability, the proposed system contributes to the evolution of cloud-based machine learning frameworks, fostering a more responsive and resource-efficient computing environment. In essence, the field of invention revolves around creating an intelligent and adaptable infrastructure for optimizing the execution of machine learning workloads within the dynamic landscape of cloud computing.

BACKGROUND OF THE INVENTION

[004] The following description provides the information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[005] Further, the approaches described in this section are approaches that could be pursued, but not necessarily approaches that have been previously conceived or pursued. Therefore, unless otherwise indicated, it should not be assumed that any of the approaches described in this section qualify as prior art merely by virtue of their inclusion in this section.

[006] In the ever-evolving landscape of information technology, the amalgamation of cloud computing and machine learning has emerged as a pivotal paradigm, promising unprecedented advancements and efficiencies. As the demand for sophisticated machine learning applications continues to surge, the need for optimizing the execution of these workloads within cloud environments becomes increasingly paramount. The intersection of these two domains necessitates innovative solutions to address the intricate challenges posed by resource allocation, task scheduling, and overall performance enhancement.

[007] Machine learning, as a field, has burgeoned with diverse applications ranging from natural language processing to image recognition, and its computational demands have grown exponentially. The intricacies of machine learning algorithms, coupled with the data-intensive nature of these applications, demand substantial computing resources for timely and efficient execution. Traditional computing infrastructures often fall short in meeting these demands, prompting the rise of cloud computing as a scalable and flexible alternative.

[008] Cloud computing, with its virtualized resources and on-demand scalability, provides an ideal platform for deploying machine learning workloads. However, the dynamic and multi-tenant nature of cloud

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environments introduces challenges in optimizing the scheduling of machine learning tasks. The conventional static task scheduling approaches struggle to cope with the dynamic nature of machine learning algorithms and varying resource requirements. Consequently, there arises a critical need for an intelligent and adaptive system that can dynamically allocate resources and schedule tasks based on real-time conditions.

[009] The proposed invention delves into this critical juncture of machine learning and cloud computing, aiming to revolutionize the efficiency of task scheduling within machine learning workloads. By leveraging advanced algorithms and intelligent decision-making processes, the system seeks to dynamically assign tasks to available computing resources, optimizing the overall performance of machine learning applications. The focus is not merely on isolated optimization but on creating a responsive and adaptable infrastructure that can scale with the increasing demands of machine learning workloads in cloud environments.

[010] The background of this proposed invention is rooted in the recognition that current approaches to task scheduling in the cloud often fall short of meeting the dynamic demands of machine learning applications. This innovation is driven by the imperative to bridge the gap between the ever-growing computational requirements of machine learning algorithms and the dynamic, scalable capabilities offered by cloud computing. The seamless integration of these technologies holds the key to unlocking new frontiers in artificial intelligence, enabling faster, more efficient, and scalable deployment of machine learning models across diverse domains and industries. As technology continues to advance, the proposed invention stands at the

forefront, poised to redefine the landscape of machine learning in the cloud and contribute significantly to the future of computational intelligence.

[011] The impetus for the development of this groundbreaking system stems from the realization that the symbiotic relationship between cloud computing and machine learning represents a transformative force in the digital era. As organizations increasingly harness the power of machine learning to glean insights, automate processes, and drive innovation, the demand for a robust and responsive infrastructure becomes paramount. The traditional silos between data processing, storage, and computation are dismantled by the cloud's elastic nature, allowing for on-demand resource allocation and scalability. However, the potential of this synergy is hindered by the challenge of effectively managing and optimizing the myriad tasks inherent in machine learning workflows.

[012] In the intricate realm of machine learning, algorithms span a spectrum from simple linear models to complex neural networks, each with distinct computational requirements. The heterogeneity of these algorithms, coupled with the variability in data characteristics and workload patterns, presents a formidable challenge for conventional static scheduling methods. The proposed system recognizes the need for a paradigm shift, envisioning an intelligent, self-adapting scheduler capable of navigating the dynamic landscape of machine learning tasks within cloud environments.

[013] Furthermore, the proliferation of multi-tenant cloud infrastructures, where multiple users and applications share resources, exacerbates the complexity of task scheduling. Competing for resources in such an environment requires a nimble and sophisticated approach that traditional scheduling mechanisms

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struggle to provide. The proposed invention rises to this challenge by incorporating machine learning into the very fabric of task scheduling, allowing the system to learn and adapt to workload patterns, resource availability, and the unique requirements of diverse machine learning algorithms.

[014] In conclusion, the proposed system represents a departure from static, rule-based scheduling methodologies, ushering in an era of intelligent, data-driven decision-making for task allocation. The innovation lies not only in the optimization of individual tasks but in the orchestration of an entire ecosystem of machine learning workloads. By seamlessly integrating with the cloud infrastructure, the system becomes an orchestrator of computational resources, ensuring that each task is allocated the optimal resources at the right moment, thereby maximizing efficiency, reducing latency, and minimizing costs.

[015] The journey of this invention is intertwined with the broader narrative of technological evolution, where the union of cloud computing and machine learning propels us into uncharted territories. It is a response to the escalating demands of industries and researchers grappling with ever-expanding datasets and increasingly complex algorithms. The proposed system, with its adaptive intelligence, not only addresses the current challenges but positions itself as a future-proof solution, capable of evolving alongside the rapid advancements in both cloud computing and machine learning.

[016] In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the drawings. The invention is capable of other objects and of being practiced and carried out in various ways,

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according to the need of that industry. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[017] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

SUMMARY OF THE PRESENT INVENTION

[018] The proposed invention addresses the evolving intersection of cloud computing and machine learning, recognizing the escalating demand for optimized task scheduling within machine learning workloads. Grounded in the acknowledgment that traditional approaches struggle to meet the dynamic nature of machine learning algorithms, the system aims to revolutionize efficiency by dynamically allocating resources and intelligently scheduling tasks in real-time. Motivated by the complexity of diverse machine learning algorithms and the variability in workload patterns,

[019] the innovation goes beyond static scheduling methods. Instead, it envisions an adaptive scheduler that integrates machine learning into its core, learning and adapting to workload intricacies, resource availability, and algorithmic requirements.

[020] The system's intelligence extends beyond optimizing individual tasks, orchestrating an entire ecosystem of machine learning workloads. By

seamlessly integrating with cloud infrastructure, it becomes a responsive orchestrator of computational resources, maximizing efficiency, reducing latency, and minimizing costs. Positioned at the forefront of technological evolution, the proposed invention aligns with the data-driven future, where it not only addresses current challenges but establishes itself as a future-proof solution, capable of evolving alongside rapid advancements in both cloud computing and machine learning.

[021] It stands as a testament to innovation, pushing the boundaries of what is conceivable and paving the way for a seamless integration of machine learning and cloud computing in diverse domains.

[022] In this respect, before explaining at least one object of the invention in detail, it is to be understood that the invention is not limited in its application to the details of set of rules and to the arrangements of the various models set forth in the following description or illustrated in the drawings. The invention is capable of other objects and of being practiced and carried out in various ways, according to the need of that industry. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[023] These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the disclosure. For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be made to the accompanying drawings and descriptive matter in which there are illustrated preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[024] When considering the following thorough explanation of the present invention, it will be easier to understand it and other objects than those mentioned above will become evident. Such description refers to the illustrations in the annex, wherein:

[025] FIG. 1, illustrates a general functional working diagram, in accordance with an embodiment of the present invention.

[026] FIG. 2, illustrates a concept of the functional flow diagram, in accordance with an embodiment of the present invention. in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[027] The following sections of this article will provide various embodiments of the current invention with references to the accompanying drawings, whereby the reference numbers utilised in the picture correspond to like elements throughout the description. However, this invention is not limited to the embodiment described here and may be embodied in several other ways. Instead, the embodiment is included to ensure that this disclosure is extensive and complete and that individuals of ordinary skill in the art are properly informed of the extent of the invention.

[028] Numerical values and ranges are given for many parts of the implementations discussed in the following thorough discussion. These numbers and ranges are merely to be used as examples and are not meant to restrict the claims' applicability. A variety of materials are also recognised as fitting for certain aspects of the implementations. These materials should only

be used as examples and are not meant to restrict the application of the innovation.

[029] Referring now to the drawings, these are illustrated in **FIG. 1&2,** The proposed invention represents a pioneering solution at the confluence of two transformative realms - cloud computing and machine learning. As we navigate the complexities of a data-driven era, where the demands for processing power and intelligent insights continue to surge, the intersection of these technologies becomes increasingly crucial. At its core, the invention seeks to address a critical aspect of this intersection - the optimization of task scheduling within machine learning workloads deployed in cloud environments.

[030] Machine learning, with its vast array of applications spanning from predictive analytics to image recognition, has become an integral part of numerous industries. However, the computational demands of machine learning algorithms, coupled with the exponential growth of datasets, present challenges that traditional computing infrastructures struggle to surmount. Enter cloud computing, a dynamic paradigm that offers scalable and virtualized resources, providing an ideal platform for deploying machine learning workloads. Yet, the dynamic and multi-tenant nature of cloud environments introduces complexities in effectively managing and scheduling machine learning tasks.

[031] The proposed system emerges as a response to this intricate challenge. It delves into the dynamic landscape of machine learning algorithms, each with its unique computational requirements, and the fluctuating nature of data processing needs. Traditional static scheduling methodologies are deemed insufficient in the face of such dynamism. The invention seeks to transcend

these limitations, envisioning an intelligent, adaptive scheduler that learns and evolves in real-time.

[032] At the heart of this innovation is the integration of advanced algorithms and machine learning principles into the task scheduling process. The system aims to dynamically allocate computing resources based on the real-time demands of machine learning tasks, optimizing overall performance. It adapts to varying workload patterns, resource availability, and the intricacies of diverse machine learning algorithms. The intelligence embedded within the scheduler goes beyond mere optimization of individual tasks; it orchestrates the entire ecosystem of machine learning workloads.

[033] The challenges extend further in multi-tenant cloud environments, where numerous users and applications vie for resources. Conventional scheduling methods struggle to manage this complexity, often leading to suboptimal resource allocation. The proposed system steps in as an adaptive orchestrator, navigating the nuances of competing demands and ensuring that each machine learning task receives the optimal resources at the right moment.

[034] As technology evolves, so does the proposed system. It envisions itself as a future-proof solution, capable of adapting to the rapid advancements in both cloud computing and machine learning. The seamless integration with cloud infrastructure positions it as a linchpin in the data-driven future, where computational resources are harnessed with unprecedented efficiency. The invention stands not merely as a technological advancement but as a testament to innovation, pushing the boundaries of what is conceivable and paving the way for a new era in the seamless integration of machine learning and cloud computing across diverse domains and industries. It embodies the spirit of

progress, anticipating and addressing the challenges of a digital landscape in perpetual transformation.

[035] The proposed invention is a manifestation of the ongoing quest to optimize the synergy between cloud computing and machine learning. Its significance lies in its ability to navigate the intricate web of challenges posed by the dynamic and resource-intensive nature of contemporary machine learning applications.

[036] Machine learning, once a niche field, has burgeoned into a ubiquitous force driving innovation across various sectors. From healthcare to finance, from natural language processing to autonomous vehicles, the applications are diverse and expansive. However, this proliferation of applications brings forth a new set of challenges, particularly in terms of computational demand. Traditional computing infrastructures, with their fixed resources and static allocation models, often prove inadequate to cater to the diverse computational needs of machine learning algorithms.

[037] Cloud computing, with its promise of elastic scalability and on-demand provisioning, emerges as a natural ally to address these challenges. Yet, the dynamic and shared nature of cloud environments introduces complexities in effective resource utilization. The proposed system recognizes that the key to unlocking the full potential of this alliance lies in the efficient scheduling of machine learning tasks within these dynamic cloud ecosystems.

[038] The heart of the proposed system lies in its departure from conventional, rule-based scheduling methodologies. Instead, it aspires to be an intelligent, learning scheduler that adapts to the unique requirements of each machine learning task. By incorporating machine learning principles into the scheduling

process, the system becomes capable of making real-time decisions based on the specific computational needs of diverse algorithms. This adaptability extends beyond the algorithms themselves; it encompasses variations in data characteristics, workload patterns, and the ever-changing availability of cloud resources.

[039] The orchestration of machine learning workloads becomes particularly challenging in multi-tenant cloud environments. With various users and applications competing for resources, the proposed system steps in as a responsive orchestrator, ensuring fair and optimal resource allocation. This adaptability becomes a crucial factor in enhancing not only the performance of individual tasks but the overall efficiency and cost-effectiveness of the entire machine learning ecosystem.

[040] Looking towards the future, the proposed system positions itself as more than a solution for present challenges; it is envisioned as a dynamic entity that evolves alongside the relentless progression of technology. As machine learning algorithms become more sophisticated, and cloud computing architectures continue to evolve, the system aims to remain at the forefront of this evolution. It embraces the inevitability of change and stands as a testament to the potential for harmonious integration between machine learning and cloud computing.

[041] In conclusion, the proposed invention encapsulates the spirit of innovation in the realm where machine learning and cloud computing converge. It not only addresses the current complexities of task scheduling but anticipates and adapts to the ever-evolving landscape of technology. As industries continue to leverage the power of data and intelligence, the proposed system stands poised

to play a pivotal role in shaping a future where the seamless integration of machine learning workloads in cloud environments becomes the linchpin of technological advancement. It is a manifestation of progress, embodying the relentless pursuit of efficiency, adaptability, and optimization in the digital age.

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We claim:

1. The invention discloses an intelligent task scheduler for machine learning workloads in cloud computing environments, utilizing advanced algorithms to dynamically allocate resources based on real-time demands, optimizing performance, and minimizing latency.

2. A system as claimed in claim 1, further incorporating machine learning principles to adaptively schedule tasks, considering variations in workload patterns, data characteristics, and the dynamic availability of cloud resources.

3. The invention introduces an orchestration mechanism for multi-tenant cloud environments, ensuring fair and optimal resource allocation among competing machine learning workloads, enhancing overall efficiency.

4. An adaptive scheduler as claimed in claim 1, designed to evolve alongside technological advancements, positioning itself as a future-proof solution capable of accommodating the complexities of evolving machine learning algorithms and cloud computing architectures.

5. The invention offers a novel approach to task scheduling, departing from traditional static methodologies, and provides an intelligent, learning scheduler capable of making real-time decisions for efficient resource allocation.

6. A responsive orchestrator as claimed in claim 3, fostering a seamless integration between machine learning and cloud computing, contributing to the optimization of computational resources and cost-effectiveness.

7. The proposed system, as claimed in claim 1, serves as a linchpin for diverse machine learning applications, from natural language processing to image recognition, ensuring tailored resource allocation for varied algorithmic requirements.

8. An innovative scheduler, as claimed in claim 1, addressing the challenges posed by the exponential growth of datasets, enabling scalable and efficient execution of machine learning tasks within cloud environments.

9. The invention, as claimed in claim 1, redefines the landscape of machine learning in cloud computing by providing an adaptive, intelligent solution that transcends current limitations, contributing to the evolution of computational intelligence.

10. A dynamic scheduler as claimed in claim 1, not only optimizing individual tasks but orchestrating an entire ecosystem of machine learning workloads, embodying the spirit of progress and innovation in the seamless integration of technology for the digital age.

Dated this 02nd day of February 2024

Signature: R. Sivⱥ

Applicant(s)

Mr. R. Sivasankar et. al.

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ABSTRACT

<u>OPTIMIZING MACHINE LEARNING WORKLOAD TASK SCHEDULING IN CLOUD</u>

<u>ENVIRONMENTS</u>

[042] The invention introduces an intelligent task scheduler tailored for machine learning workloads in cloud computing environments. Leveraging advanced algorithms and machine learning principles, the system dynamically allocates resources based on real-time demands, optimizing performance and minimizing latency. It adapts to variations in workload patterns, data characteristics, and the dynamic availability of cloud resources, ensuring an adaptive and efficient scheduling process. The system further addresses challenges in multi-tenant cloud environments, orchestrating fair and optimal resource allocation among competing machine learning workloads. Positioned as a future-proof solution, the invention evolves alongside technological advancements, contributing to the seamless integration of machine learning and cloud computing. With a departure from traditional static methodologies, the system serves as a linchpin for diverse machine learning applications, redefining the landscape of computational intelligence in the digital age.

Accompanied Drawing **[FIGS. 1-2]**

Dated this 02nd day of February 2024

Signature: R. Sivar
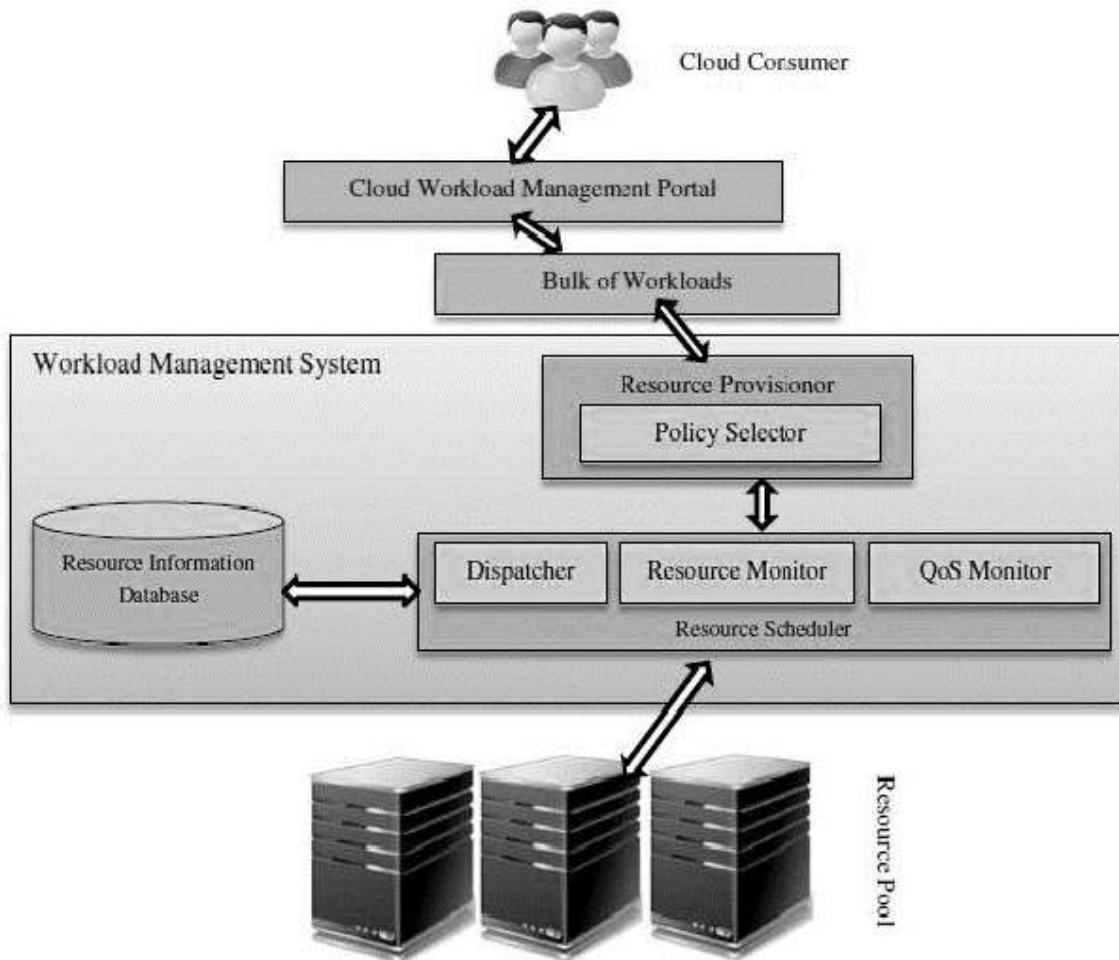
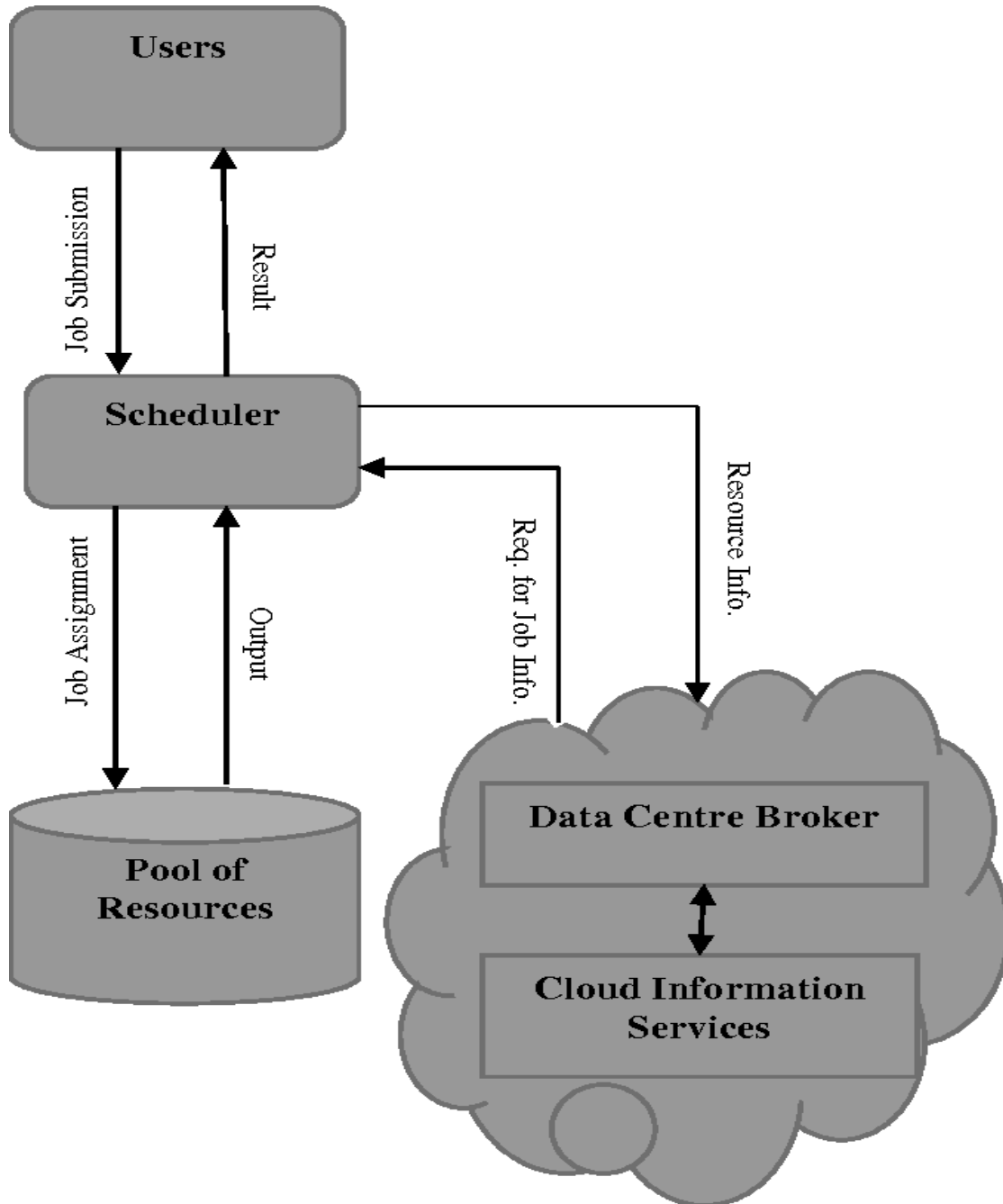**Applicant(s)**

Mr. R. Sivasankar et. al.

Figure 1

Figure 2

Dated this 2nd day of February 2024

Signature: R. Sivar

Applicant(s) Name: Mr. R. Sivasankar et. al.

FORM 3

THE PATENTS ACT,
1970 (39 of 1970)
and
THE PATENTS RULES, 2003
**STATEMENT AND UNDERTAKING UNDER
SECTION 8**
(See section 8; Rule 12)

1. Name of the applicant(s).	I/We, Mr. R. Sivasankar et. al., all are citizen of India, Address of one of the Applicant: Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108.
2. Name, address and nationality of the joint applicant.	(i) that I/We have not made any application for the same/substantially the same invention outside India Or (ii) ~~that I/We who have made this application No...~~ ~~dated alone/jointly with~~ .... ; ~~made for the same/ substantially same invention,~~ ~~application(s) for patent in the other countries, the~~ ~~particulars of which are given below:~~

Name of the Country	Date of Application	Application No.	Status of the Application	Date of Publication	Date of grant
-	-	-	-	-	-

3. Name and address of the assignee	(iii) that the rights in the application(s) has/have been assigned to …………… none …………………… …………………………………………………………… ………………………… that I/We undertake that upto the date of grant of the patent by the Controller, I/We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application. **Dated this 2nd day of February 2024**

4. To be signed by the applicant or his authorized registered patent agent.	**Signature:** R. Sivan
5. Name of the natural person who has signed.	Mr. R. Sivasankar et. al. **Name of the Applicant(s)**
	To The Controller of Patents, The Patent Office, at Chennai
Note.- Strike out whichever is not applicable;	

FORM- 5
THE PATENTS ACT, 1970
(39 of 1970)
&
The Patents Rules, 2003
DECLARATION AS TO INVENTORSHIP
[See Section 10(6) and Rule 13(6)]

1. NAME OF THE APPLICANT(S)

I/We, Mr. R. Sivasankar et. al., all are citizen of India, Address of one of the Applicant: Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108.

hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of ~~my~~ / our application numbered _____ dated 02-02-2024 ~~is~~/are

2. INVENTOR(S)

(a) NAME	(b) NATIONALITY	(c) ADDRESS
1. Mr. R. Sivasankar	Indian	Assistant Professor, Department of Computer Science and Engineering, Builders Engineering College, EBET Knowledge Park, Mullipuram Post, Nathakadaiyur, Kangeyam Taluk, Tirupur District, 638108
2. Dr. M Marikkannan	Indian	Senior Assistant Professor, Department of Computer Science and Engineering, Government College of Engineering, Sri Vasavi College, Post Erode - 638316
3. Mrs. Pathivada Monika	Indian	Assistant Professor, Department of Computer Science and Engineering, Avanthi Institute of Engineering and Technology, Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist.), 531162
4. Murali Mohan Vutukuru	Indian	Associate Professor, Department of Computer Science and Engineering, Green Fields, Vaddeswaram, Guntur District, 520002
5. Dr. P.Malathi	Indian	Associate Professor, Saveetha College of Liberal Arts and Sciences, Saveetha Institute of

		Medical and Technical Sciences, Saveetha Nagar, Thandalam, Chennai-602105
6. Nithya Nandhakumar	Indian	Assistant Professor, Department of Computer Science and Engineering, K.Ramakrishnan College of Engineering, Trichy-621112
7. Dr. C. R. Rene Robin	Indian	Professor & Dean (Innovation), Department of Computer Science and Engineering, Sri Sairam Engineering College, West Tambaram, Chennai, Tamil Nadu 600044

~~3. DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT(S) IN THE CONVENTION COUNTRY: -~~

N.A.

~~We the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from the true and first inventor(s).~~

Dated this 02nd day of February 2024

Mr. R. Sivasankar et. al.
Applicant(s)

To,
The Controller of Patents
The Patent Office, Chennai

FORM 9

THE PATENT ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003

REQUEST FOR PUBLICATION

[See section 11A (2) rule 24A]

I/We **Mr. R. Sivasankar,Dr. M Marikkannan,Mrs. Pathivada Monika,Murali Mohan Vutukuru,Dr. P.Malathi,Nithya Nandhakumar,Dr. C. R. Rene Robin** hereby request for early publication of my/our [Patent Application No.] TEMP/E-1/8481/2024-CHE

Dated **02/02/2024 00:00:00** under section 11A(2) of the Act.

Dated this(Final Payment Date):------------
Signature
Name of the signatory

To,
The Controller of Patents,
The Patent Office,
At Chennai

This form is electronically generated.