

FORM
2
THE PATENT ACT 1970

(39 OF
1970)
AND
The patent rules, 2003
COMPLETE SPECIFICATION
(See section 10: rule 13)

1. TITLE OF THE INVENTION:
“TOPOLOGY OPTIMIZATION IN IoT NETWORKS USING GRAPH THEORY”

2. APPLICANT(S):

Name	Nationality	Address
N. S. V. Kiran Kumar	Indian	Lecturer in Mathematics Govt. Degree College Mandapeta-533308
Gunnam Prasada Rao	Indian	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001
K. Chittibabu	Indian	Lecturer in Mathematics Govt. Degree College Mummidivaram-533216
G. Syam Prasad	Indian	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001
K. S. I. Priyadarsini	Indian	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001
M. VENKATESWARA RAO	Indian	LECTURER IN MATHEMATICS GOVT. DEGREE COLLEGE AVANIGADDA KRISHNA DISTRICT ANDHRAPRADESH

		PIN 521121
K. Samrajyam	Indian	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001
L. S. B. R. Bhanu	Indian	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001
K.T.N. Jyothi	Indian	Lecturer in Mathematics Ideal College of Arts and Sciences(A) Kakinada-533004
R V Satyanarayana	Indian	Lecturer in Computer Science P. R. Govt. College(A) Kakinada-533001
Dr. SOMAROUTHU V G V A PRASAD	Indian	Professor Department of Physics and Electronics P. R. Govt. College(A) Kakinada-533001

3. PREAMBLE TO THE DESCRIPTION

The following complete specification particularly describes the invention and the manner in which it is to be performed:

FIELD OF THE INVENTION

The present invention relates to the field of Internet of Things (IoT) networks, specifically focusing on network topology optimization using mathematical techniques from graph theory. This invention aims to improve connectivity, reduce latency, and enhance the efficiency of data transmission in large-scale IoT environments.

BACKGROUND OF THE INVENTION

With the exponential growth of IoT devices, efficient management of network topology has become essential. IoT networks often face challenges such as high latency, inefficient routing, and unreliable connections due to the distributed nature of devices. Traditional methods are based on heuristic or probabilistic approaches, which are insufficient to handle the complexity and dynamics of modern IoT networks.

There is a need for an intelligent and scalable approach to optimize network topology, minimizing latency while ensuring reliable data transmission. Graph theory provides a robust framework to model the network efficiently and optimize its structure, improving data transmission efficiency, fault tolerance, and energy consumption.

SUMMARY OF THE INVENTION

The present invention provides a method for optimizing IoT network topology using graph theory. This system models IoT devices and their interconnections as a graph, where nodes represent devices and edges represent communication links. The system optimizes the network based on the following objectives:

Minimized Latency: Reducing the time required for data to travel between nodes.

Optimized Routing Paths: Identifying the most efficient and reliable paths for data transmission.

Improved Network Robustness: Enhancing the network's fault tolerance against node or link failures.

Energy Efficiency: Reducing power consumption by minimizing unnecessary communication and optimizing device wake-up schedules.

This invention applies graph-theoretic algorithms, including minimum spanning trees (MST), shortest path algorithms, network flow algorithms, and Eulerian circuits, to achieve optimal topology. It also supports dynamic re-optimization based on real-time changes in the network.

DETAILED DESCRIPTION OF THE INVENTION

1. System Architecture

The system architecture consists of:

A network graph model, where nodes represent devices and edges represent communication links.

A centralized server that runs graph-theory-based optimization algorithms.

A real-time update module that dynamically re-optimizes the network based on changes in device locations or network conditions.

2. Graph-Theory Algorithms for Optimization

Minimum Spanning Tree (MST):

Reduces communication costs by minimizing the total number of edges while maintaining connectivity without cycles.

Shortest Path Algorithm (Dijkstra):

Identifies the most efficient paths between any two devices, ensuring reduced latency.

Max Flow-Min Cut Algorithm:

Ensures maximum data flow through the network while minimizing bottlenecks.

Eulerian Path/Circuit:

Ensures efficient traversal of the network by covering all nodes with minimal path repetition, conserving energy.

3. Dynamic Topology Adaptation

The system monitors the state of the network continuously. In case of new device addition, removal, or failure, the system dynamically re-optimizes the topology using real-time data to maintain performance. The changes are instantly reflected, ensuring uninterrupted connectivity.

4. Energy Efficiency Optimization

The invention reduces energy consumption by:

Eliminating redundant communication links through the MST algorithm.

Optimizing wake-up schedules of IoT devices, ensuring devices are active only when needed to extend battery life.

5. Network Robustness and Fault Tolerance

The system ensures network reliability through redundancy. In case of node or link failure, the system identifies alternate paths for data transmission using edge-connectivity and flow algorithms, ensuring fault tolerance.

WE CLAIMS

1. A method for optimizing IoT network topology using graph theory, wherein the network is modeled as a graph with nodes representing devices and edges representing communication links, the method comprising:

- a. Applying a minimum spanning tree (MST) algorithm to minimize communication costs;
- b. Utilizing a shortest path algorithm to reduce data transmission latency;
- c. Implementing network flow algorithms to enhance the efficiency and reliability of data flow.

The method of claim 1, wherein the MST algorithm dynamically adjusts the topology based on real-time changes, including the addition or removal of devices.

The method of claim 1, wherein energy efficiency is achieved by minimizing redundant communication links and optimizing device wake-up schedules.

The method of claim 1, wherein fault tolerance is ensured by identifying alternative routing paths during node or connection failures.

A system for real-time optimization of IoT network topology, comprising:

- a. A server running graph-theory-based algorithms; and
- b. A module for dynamic updates of the network based on real-time data.

Date: 04-11-2024.

M. g. Sudheer

MAMILLAPALLI SUDHEER

[IN/PA-3073]

PATENT ATTORNEY & AGENT

ABSTRACT

The invention presents a novel method for optimizing the topology of Internet of Things (IoT) networks using graph theory. By modelling the network as a graph and applying algorithms such as the minimum spanning tree (MST) and shortest path algorithms, the system minimizes latency, improves routing efficiency, and reduces energy consumption. The system dynamically adapts to changes in the network, ensuring continuous optimization and robustness against failures. This invention provides a scalable solution for managing large-scale IoT networks with minimal energy usage and maximum connectivity.

Diagram:

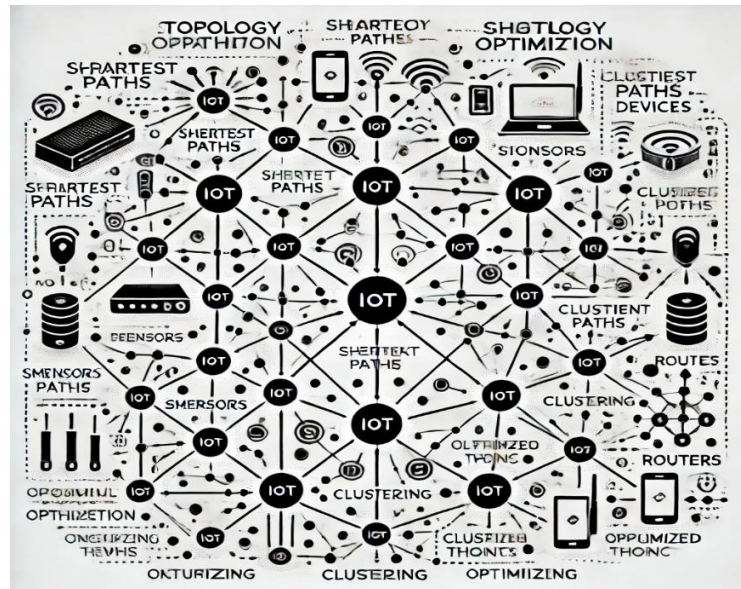
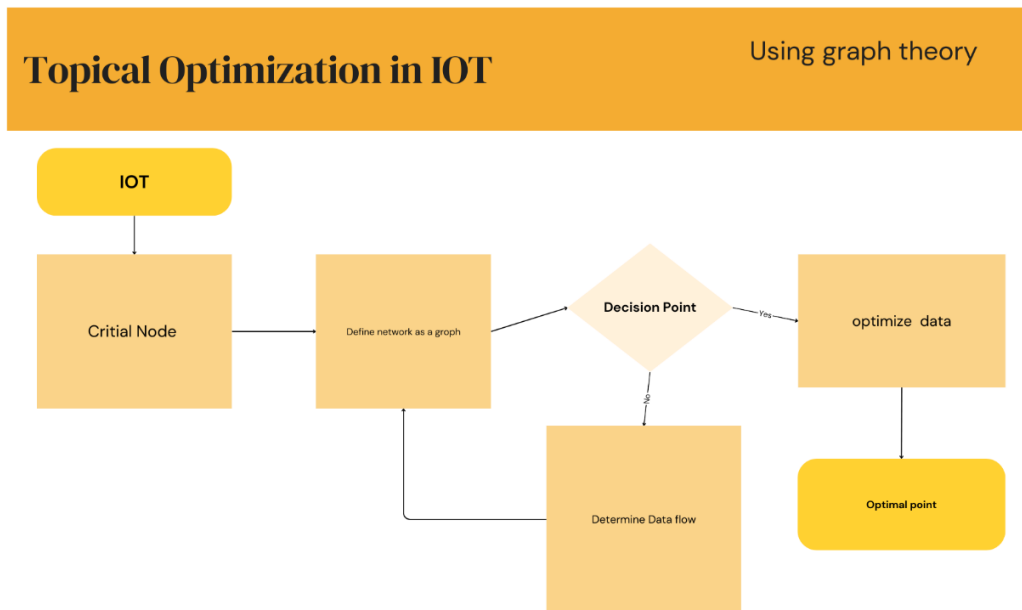


Figure :1



Figure :2

Flow chart :



FORM 1
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
APPLICATION FOR GRANT OF PATENT
[See sections 7,54 & 135 and rule 20(1)]

(FOR OFFICE USE ONLY)

Application No.:
Filing Date:
Amount of Fee Paid:
CBR No.:
Signature:

1. APPLICANT(S):

Sr.No.	Name	Nationality	Address	Country	State	Distict	City
1	N. S. V. Kiran Kumar	India	Lecturer in Mathematics Govt. Degree College Mandapeta-533308	India	Andhra Pradesh	East Godavari	
2	Gunnam Prasada Rao	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
3	K. Chittibabu	India	Lecturer in Mathematics Govt. Degree College Mummdivaram-533216.	India	Andhra Pradesh	East Godavari	
4	G. Syam Prasad	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
5	K. S. I. Priyadarsini	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
6	M. VENKATESWARA RAO	India	LECTURER IN MATHEMATICS GOVT. DEGREE COLLEGE AVANIGADDA KRISHNA DISTRICT ANDHRAPRADESH PIN 521121	India	Andhra Pradesh	Krishna	Machilipatnam
7	K. Samrajyam	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
8	L. S. B. R. Bhanu	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
9	K.T.N. Jyothi	India	Lecturer in Mathematics Ideal College of Arts and	India	Andhra Pradesh	East Godavari	Kakinada

			Sciences(A) Kakinada-533004				
10	R V Satyanarayana	India	Lecturer in Computer Science P. R. Govt. College(A) Kakinada- 533001.	India	Andhra Pradesh	East Godavari	Kakinada
11	Dr. SOMAROUTHU V G V A PRASAD	India	Professor Department of Physics and Electronics P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada

2. INVENTOR(S):

Sr.No.	Name	Nationality	Address	Country	State	Distict	City
1	N. S. V. Kiran Kumar	India	Lecturer in Mathematics Govt. Degree College Mandapeta-533308	India	Andhra Pradesh	East Godavari	
2	Gunnam Prasada Rao	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
3	K. Chittibabu	India	Lecturer in Mathematics Govt. Degree College Mummidivaram- 533216.	India	Andhra Pradesh	East Godavari	
4	G. Syam Prasad	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
5	K. S. I. Priyadarsini	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
6	M. VENKATESWARA RAO	India	LECTURER IN MATHEMATICS GOVT. DEGREE COLLEGE AVANIGADDA KRISHNA DISTRICT ANDHRAPRADESH PIN 521121	India	Andhra Pradesh	Krishna	Machilipatnam
7	K. Samrajyam	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
8	L. S. B. R. Bhanu	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
9	K.T.N. Jyothi	India	Lecturer in Mathematics Ideal	India	Andhra Pradesh	East Godavari	Kakinada

			College of Arts and Sciences(A) Kakinada-533004				
10	R V Satyanarayana	India	Lecturer in Computer Science P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada
11	Dr. SOMAROUTHU V G V A PRASAD	India	Professor Department of Physics and Electronics P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada

3. TITLE OF THE INVENTION: TOPOLOGY OPTIMIZATION IN IoT NETWORKS USING GRAPH THEORY**4. ADDRESS FOR CORRESPONDENCE OF APPLICANT /
AUTHORISED PATENT AGENT IN INDIA:**

VolksPhantom IP Solutions Pvt Ltd.# 1st Floor, Above GDCC
Bank, 5th Line Naidu Pet, Koritepadu- Guntur, Andhra Pradesh-
522007, India.

Telephone No.:

Fax No.:

Mobile No: 7075727315

E-mail: volksphantomip@gmail.com

5. PRIORITY PARTICULARS OF THE APPLICATION(S) FILED IN CONVENTION COUNTRY:

Sr.No.	Country	Application Number	Filing Date	Name of the Applicant	Tilte of the Invention
--------	---------	--------------------	-------------	-----------------------	------------------------

6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE APPLICATION:

International Application Number	International Filing Date as Allotted by the Receiving Office
PCT//	

7. PARTICULARS FOR FILING DIVISIONAL APPLICATION

Original (first) Application Number	Date of Filing of Original (first) Application
-------------------------------------	--

8. PARTICULARS FOR FILING PATENT OF ADDITION:

Main Application / Patent Number:	Date of Filing of Main Application
-----------------------------------	------------------------------------

9. DECLARATIONS:**(i) Declaration by the inventor(s)**

I/We ,N. S. V. Kiran Kumar,Gunnam Prasada Rao,K. Chittibabu,G. Syam Prasad,K. S. I. Priyadarsini,M. VENKATESWARA RAO,K. Samrajyam,L. S. B. R. Bhanu,K.T.N. Jyothi,R V Satyanarayana,Dr.

SOMAROUTHU V G V A PRASAD, 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: -----

(b) Signature(s) of the inventor(s):

(c) Name(s): N. S. V. Kiran Kumar, Gunnam Prasada Rao, K. Chittibabu, G. Syam Prasad, K. S. I. Priyadarsini, M. VENKATESWARA RAO, K. Samrajyam, L. S. B. R. Bhanu, K. T. N. Jyothi, R. V. Satyanarayana, Dr. SOMAROUTHU V G V A PRASAD

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

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 singnatory: N. S. V. Kiran Kumar, Gunnam Prasada Rao, K. Chittibabu, G. Syam Prasad, K. S. I. Priyadarsini, M. VENKATESWARA RAO, K. Samrajyam, L. S. B. R. Bhanu, K. T. N. Jyothi, R. V. Satyanarayana, Dr. SOMAROUTHU V G V A PRASAD

(iii) Declaration by the applicant(s)

- The Complete specification relating to the invention is filed with this application.
- I am/We are, in the possession of the above mentioned invention.
- There is no lawful ground of objection to the grant of the Patent to me/us.
- I am/We are, the assignee or legal representative to true first inventors.

10. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION:

Sr.	Document Description	FileName
-----	----------------------	----------

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

Dated this(Final Payment Date): -----

Signature:

Name: MAMILLAPALLI SUDHEER

To The Controller of Patents

The Patent office at CHENNAI

This form is electronically generated.

FORM 9 THE PATENT ACT, 1970 (39 of 1970) & THE PATENTS RULES, 2003 REQUEST FOR PUBLICATION [See section 11A (2) rule 24A]	
I/We N. S. V. Kiran Kumar,Gunnam Prasada Rao,K. Chittibabu,G. Syam Prasad,K. S. I. Priyadarsini,M. VENKATESWARA RAO,K. Samrajyam,L. S. B. R. Bhanu,K.T.N. Jyothi,R V Satyanarayana,Dr. SOMAROUTHU V G V A PRASAD hereby request for early publication of my/our [Patent Application No.] TEMP/E-1/97672/2024-CHE	
Dated 04/11/2024 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.



INDIA NON JUDICIAL



IN-AP35104016526860W

Government of Andhra Pradesh

e-Stamp

Certificate No. : IN-AP35104016526860W
Certificate Issued Date : 30-Oct-2024 12:53 PM
Account Reference : NEWIMPACC (IV)/ ap18189403/ AP-BPT/ AP-BPR/apkikugou
DDO Code : 27002308001 O/o IG R
Unique Doc. Reference : SUBIN-APAP1818940357490230131288W
Purchased by : VOLKSPHANTOM IP SOLUTIONS PRIVATE LIMITED
Description of Document : Article 42 Power of Attorney
Property Description : POWER OF ATTORNEY
Consideration Price (Rs.) : 0
(Zero)
First Party : VOLKSPHANTOM IP SOLUTIONS PRIVATE LIMITED
Second Party : Not Applicable
Paid By (For Whom) : VOLKSPHANTOM IP SOLUTIONS PRIVATE LIMITED
Stamp Duty Amount(Rs.) : 100
(One Hundred only)



Please write or type below this line

FORM-26
PATENT ACT, 1970
(39 OF 1970)

FORM OF AUTHORISATION OF PATENT AGENT
IN A MATTER OF PROCEEDING UNDER THE ACT
(See Section 127 and 132; Rule 135)

N. S. V. KIRAN KUMAR, Indian citizen of Lecturer in Mathematics, Govt. Degree College Mandapeta-533308, Andhra Pradesh, India. **GUNNAM PRASADA RAO**, Indian citizen of Lecturer in Mathematics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **K. CHITTIBABU**, Indian citizen of Lecturer in Mathematics, Govt. Degree College, Mummidivaram-533216, Andhra Pradesh, India. **G. SYAM PRASAD**, Indian citizen of Lecturer in Mathematics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **K. S. I. PRIYADARSINI**, Indian citizen of Lecturer in Mathematics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **M. VENKATESWARA RAO**, Indian citizen of Lecturer in Mathematics, Govt. Degree

HDF 0021991651

Statutory Alert:

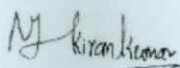
1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

College, Avanigadda, Krishna District, Andhra Pradesh-521121, India. **K. SAMRAJYAM**, Indian citizen of Lecturer in Mathematics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **L. S. B. R. BHANU**, Indian citizen of Lecturer in Mathematics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **K.T.N. JYOTHI**, Indian citizen of Lecturer in Mathematics, Ideal College of Arts and Sciences(A), Kakinada-533004, Andhra Pradesh, India. **R V SATYANARAYANA**, Indian citizen of Lecturer in Computer Science, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. **Dr. SOMAROUTHU V G V A PRASAD**, Indian citizen of Professor Department of Physics and Electronics, P. R. Govt. College(A), Kakinada-533001, Andhra Pradesh, India. Hereby authorize **MAMILLAPALLI SUDHEER**, [IN/PA/3073] Registered Patent Agent and Attorney, an Indian residing at #1st Floor, above GDCC Bank, 5th line Naidupet, Koritepadu, Guntur -522007, Andhra Pradesh, to act on our behalf in connection with filing and prosecution of patent application, taking over existing applications, and/or for prosecuting existing patent application from time to time, renewal/restoration/assignment/rectification and all such proceedings, to represent us and sign all forms and documents on our behalf and to do all acts to be performed by an agent and attorney under the provisions of the Indian patents Act, 1970 and also to appoint substitute(s) as maybe necessary or expedient, and request that all notices, requisitions and communications relating thereto may be sent to such person at the address unless otherwise specified.

I, hereby revoke all previous authorizations, if any, in respect of same matter or proceeding.

We, hereby assent to the action already taken by the said person in the above matter.

1. N. S. V. Kiran Kumar



(Signature of the applicant)

2. Gunnam Prasada Rao



(Signature of the applicant)

3. K. Chittibabu

K. Chittibabu

(Signature of the applicant)

5. K. S. I. Priyadarsini

K. S. I. Priyadarsini

(Signature of the applicant)

7. K. Samrajyam

K. Samrajyam

(Signature of the applicant)

9. K.T.N. Jyothi

K.T.N. Jyothi

(Signature of the applicant)

11. Dr. Somarouthu V G V A Prasad

Somarouthu V G V A Prasad

(Signature of the applicant)

4. G. Syam Prasad

G. Syam Prasad

(Signature of the applicant)

6. M. Venkateswara Rao

M. Venkateswara Rao

(Signature of the applicant)

8. L. S. B. R. Bhanu

L. S. B. R. Bhanu

(Signature of the applicant)

10. R V Satyanarayana

R. V. Satyanarayana

(Signature of the applicant)

Dated this at 30th day of October, 2024.

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

FORM 1
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
APPLICATION FOR GRANT OF PATENT
[See sections 7,54 & 135 and rule 20(1)]

(FOR OFFICE USE ONLY)

Application No.:
Filing Date:
Amount of Fee Paid:
CBR No.:
Signature:

1. APPLICANT(S):

Sr.No.	Name	Nationality	Address	Country	State	Distict	City
1	N. S. V. Kiran Kumar	India	Lecturer in Mathematics Govt. Degree College Mandapeta-533308	India	Andhra Pradesh	East Godavari	
2	Gunnam Prasada Rao	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
3	K. Chittibabu	India	Lecturer in Mathematics Govt. Degree College Mummdivaram-533216.	India	Andhra Pradesh	East Godavari	
4	G. Syam Prasad	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
5	K. S. I. Priyadarsini	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
6	M. VENKATESWARA RAO	India	LECTURER IN MATHEMATICS GOVT. DEGREE COLLEGE AVANIGADDA KRISHNA DISTRICT ANDHRAPRADESH PIN 521121	India	Andhra Pradesh	Krishna	Machilipatnam
7	K. Samrajyam	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
8	L. S. B. R. Bhanu	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
9	K.T.N. Jyothi	India	Lecturer in Mathematics Ideal College of Arts and	India	Andhra Pradesh	East Godavari	Kakinada

			Sciences(A) Kakinada-533004				
10	R V Satyanarayana	India	Lecturer in Computer Science P. R. Govt. College(A) Kakinada- 533001.	India	Andhra Pradesh	East Godavari	Kakinada
11	Dr. SOMAROUTHU V G V A PRASAD	India	Professor Department of Physics and Electronics P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada

2. INVENTOR(S):

Sr.No.	Name	Nationality	Address	Country	State	Distict	City
1	N. S. V. Kiran Kumar	India	Lecturer in Mathematics Govt. Degree College Mandapeta-533308	India	Andhra Pradesh	East Godavari	
2	Gunnam Prasada Rao	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
3	K. Chittibabu	India	Lecturer in Mathematics Govt. Degree College Mummidivaram- 533216.	India	Andhra Pradesh	East Godavari	
4	G. Syam Prasad	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
5	K. S. I. Priyadarsini	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
6	M. VENKATESWARA RAO	India	LECTURER IN MATHEMATICS GOVT. DEGREE COLLEGE AVANIGADDA KRISHNA DISTRICT ANDHRAPRADESH PIN 521121	India	Andhra Pradesh	Krishna	Machilipatnam
7	K. Samrajyam	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
8	L. S. B. R. Bhanu	India	Lecturer in Mathematics P. R. Govt. College(A) Kakinada-533001	India	Andhra Pradesh	East Godavari	Kakinada
9	K.T.N. Jyothi	India	Lecturer in Mathematics Ideal	India	Andhra Pradesh	East Godavari	Kakinada

			College of Arts and Sciences(A) Kakinada-533004				
10	R V Satyanarayana	India	Lecturer in Computer Science P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada
11	Dr. SOMAROUTHU V G V A PRASAD	India	Professor Department of Physics and Electronics P. R. Govt. College(A) Kakinada-533001.	India	Andhra Pradesh	East Godavari	Kakinada

3. TITLE OF THE INVENTION: TOPOLOGY OPTIMIZATION IN IoT NETWORKS USING GRAPH THEORY

4. ADDRESS FOR CORRESPONDENCE OF APPLICANT / AUTHORISED PATENT AGENT IN INDIA:

VolksPhantom IP Solutions Pvt Ltd.# 1st Floor, Above GDCC
Bank, 5th Line Naidu Pet, Koritepadu- Guntur, Andhra Pradesh-
522007, India.

Telephone No.:

Fax No.:

Mobile No: 7075727315

E-mail: volksphantomip@gmail.com

5. PRIORITY PARTICULARS OF THE APPLICATION(S) FILED IN CONVENTION COUNTRY:

Sr.No.	Country	Application Number	Filing Date	Name of the Applicant	Tilte of the Invention
--------	---------	--------------------	-------------	-----------------------	------------------------

6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE APPLICATION:

International Application Number	International Filing Date as Allotted by the Receiving Office
PCT//	

7. PARTICULARS FOR FILING DIVISIONAL APPLICATION

Original (first) Application Number	Date of Filing of Original (first) Application
-------------------------------------	--

8. PARTICULARS FOR FILING PATENT OF ADDITION:

Main Application / Patent Number:	Date of Filing of Main Application
-----------------------------------	------------------------------------

9. DECLARATIONS:

(i) Declaration by the inventor(s)

I/We ,N. S. V. Kiran Kumar,Gunnam Prasada Rao,K. Chittibabu,G. Syam Prasad,K. S. I. Priyadarsini,M. VENKATESWARA RAO,K. Samrajyam,L. S. B. R. Bhanu,K.T.N. Jyothi,R V Satyanarayana,Dr.

SOMAROUTHU V G V A PRASAD, 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: -----

(b) Signature(s) of the inventor(s):

(c) Name(s): N. S. V. Kiran Kumar, Gunnam Prasada Rao, K. Chittibabu, G. Syam Prasad, K. S. I. Priyadarsini, M. VENKATESWARA RAO, K. Samrajyam, L. S. B. R. Bhanu, K. T. N. Jyothi, R. V. Satyanarayana, Dr. SOMAROUTHU V G V A PRASAD

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

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 singnatory: N. S. V. Kiran Kumar, Gunnam Prasada Rao, K. Chittibabu, G. Syam Prasad, K. S. I. Priyadarsini, M. VENKATESWARA RAO, K. Samrajyam, L. S. B. R. Bhanu, K. T. N. Jyothi, R. V. Satyanarayana, Dr. SOMAROUTHU V G V A PRASAD

(iii) Declaration by the applicant(s)

- The Complete specification relating to the invention is filed with this application.
- I am/We are, in the possession of the above mentioned invention.
- There is no lawful ground of objection to the grant of the Patent to me/us.
- I am/We are, the assignee or legal representative to true first inventors.

10. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION:

Sr.	Document Description	FileName
-----	----------------------	----------

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

Dated this(Final Payment Date): -----

Signature:

Name: MAMILLAPALLI SUDHEER

To The Controller of Patents

The Patent office at CHENNAI

This form is electronically generated.

FORM 9 THE PATENT ACT, 1970 (39 of 1970) & THE PATENTS RULES, 2003 REQUEST FOR PUBLICATION [See section 11A (2) rule 24A]	
I/We N. S. V. Kiran Kumar,Gunnam Prasada Rao,K. Chittibabu,G. Syam Prasad,K. S. I. Priyadarsini,M. VENKATESWARA RAO,K. Samrajyam,L. S. B. R. Bhanu,K.T.N. Jyothi,R V Satyanarayana,Dr. SOMAROUTHU V G V A PRASAD hereby request for early publication of my/our [Patent Application No.] TEMP/E-1/97672/2024-CHE	
Dated 04/11/2024 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.