3.2.1: Institution has created an ecosystem for innovations and has initiatives for creation and transfer of knowledge

Sr. No	Details
1.	Coding as Institute's Core competencies"
2.	Hackathon participation/winning certificate
3.	Topics of Research undertaken at our Institute
4.	Patents filled/granted

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

"Coding as Institute's Core competencies"

MHRD'S INNOVATION CELL (GOVERNMENT OF INDIA)

Date: 19-06-2021

Sub: Toycathon 2021 (Digital Edition) related

Dear Sir/Madam,

Greetings from the Ministry of Education's Innovation Cell.

We are glad to inform you that we have selected **Thadomal Shahani Engineering College, Mumbai** for hosting **Toycathon 2021** (Digital Edition) that is going to be organized from 22nd-24th June 2021 and the winners will be declared on 26th June 2021.

The Digital Edition of Toycathon focuses on conceptualizing new and innovative games/apps based on Indian history, ethos and cardboard based toys using local materials which are economical, affordable, safe, environment friendly. The Toycathon is jointly organised by Ministry of Education's Innovation Cell, All India Council for Technical Education, Ministry of Women and Child Development, Ministry of Education, Ministry of Commerce and Industry Promotion, Ministry of Textile, Ministry of Information and Broadcasting, Ministry of MSME.

In this event, around 1300+ participants have confirmed their participation in the grand finale of Toycathon (Digital Edition). The honourable Prime Minister of India Sh. Narendra Modi has also consented to address the participants on 24th June 2021.

As a nodal center your responsibility is to coordinate with the participating teams assigned to you and make sure their presence in various sessions as per their schedule during the event.

We would also like to take this opportunity to remind you to follow all COVID related guidelines during the event and not to allow any team to enter your campus.

As a part of our commitment to respect everyone's Intellectual Rights you are requested not to keep or circulate any Toycathon related ideas unless until allowed by AICTE/MIC or its nominee.

For further communication, you may reach out to Mr Shubham Agrawal, Startup Fellow, +91-85598-16775.

Yours sincerely

Dr Mohit Gambhir
Innovation Director

Registrar/Principal/Director
Thadomal Shahani Engineering College, Mumbai
Mumbai, Maharashtra

Copy for information to
Tasneem Mirza
Single Point of Contact for Toycathon
Thadomal Shahani Engineering College, Mumbai

AICTE, Nelson Mandela Marg, Vasant Kunj, New Delhi – 110070 +91 1129581316 mic-mhrd@gov.in

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

Overview of Online Hackathon

TSEC CodeStorm organized **the first ever Online Hackathon** for 72 hours via the Zoom App. We aim to provide an opportunity to all the young talented engineers amidst the pandemic and hence we came up with the idea of Innovation at Home. There were 49 teams competing against each other to provide the best possible solution for the following domains:

1. AI/ML
2. Block Chain
3. Open Research
4. Web/App Development

The prizes for the Winning, 1st Runner Up and 2nd Runner-Up teams were 10,000, 5,000 and 3,000 respectively along with AI/ML course from one of our sponsors Let's Upgrade and internships opportunity to young talented engineers from Career Amaze. Apart from these, we had another company named SITH on board which provided selected courses to our top innovative students.

Not only this, one of our mentor Mr. Jay Shah has approached two of our teams for future collaborations and opportunity and Mr. Sumeet Rohra has joined hands with a student from our Hackathon to join his company and work with him.

The Hackathon was managed and planned by 12 members and 3 teachers over a period of a month.

The Winning Teams are:

Winner → Topic: Parking Occupancy Detection and Reservation System in Private and Public Parking spaces using Deep Neural Networks
College: Vidyalankar Institute of Technology (VIT)
Team Members: Vignesh Dhuri, Afzal Khan, Yash Kamtekar

1st Runner-up → Topic: Smart Water Monitoring and Mentoring
College: Thadomal Shahani Engineering College
Team Members:

2nd Runner-up → Topic: Grace -The Health App
College:
Team Members: Rahul Gala,

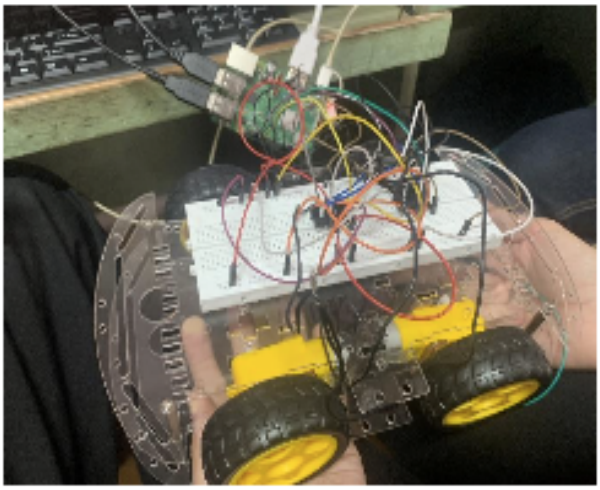
Glimpses of the Event:

Faculty and Judges

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.


Judging Round


Participants

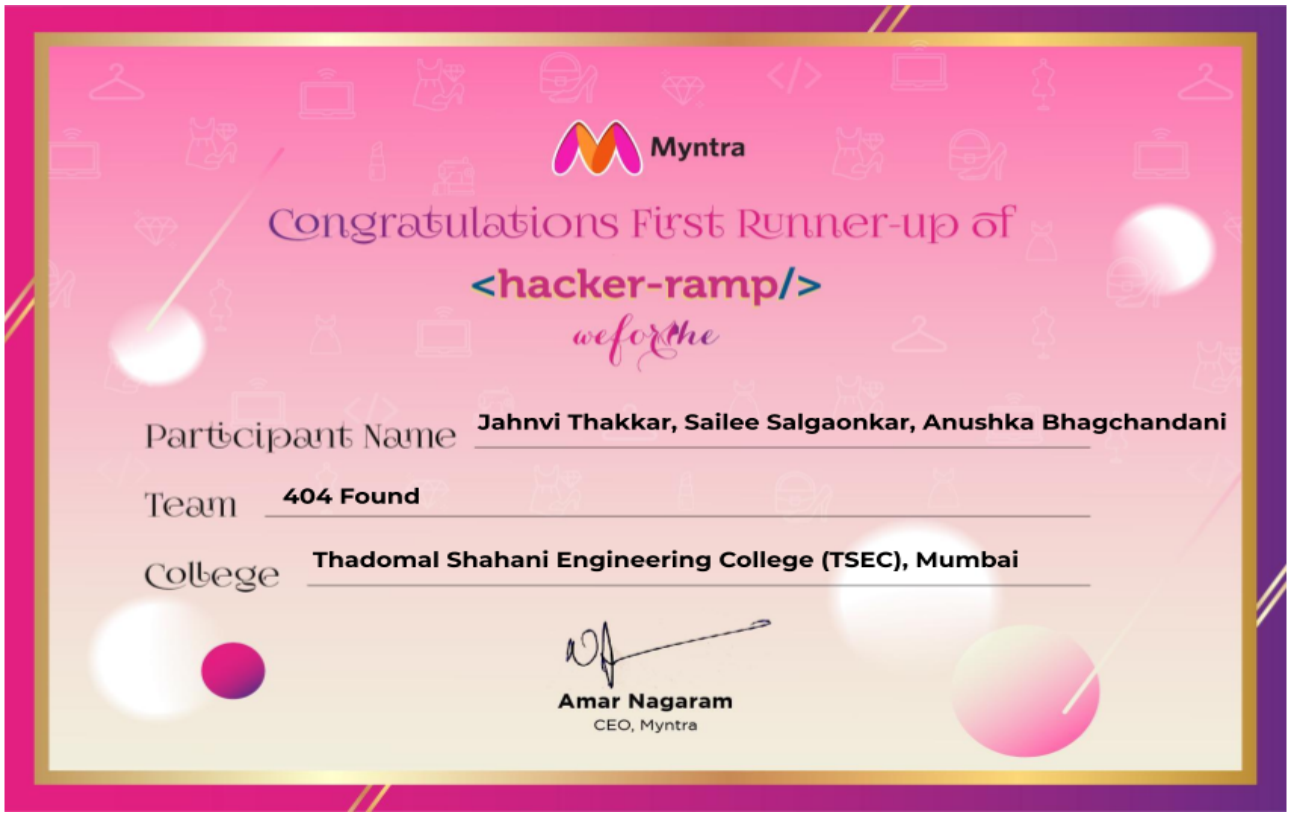



Projects Presented by Participants

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

Hackathon participation/winning certificate

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.



Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

EY Techathon 2021: Winner from your college

1 message

EY Techathon <techathon@in.ey.com> 16 February 2021 at 11:21
To: "tsec.placement@gmail.com" <tsec.placement@gmail.com>
Cc: Ovi Patel <oveshpatel16@gmail.com>

Winner from your college!

We are delighted to share that this year's edition was won by team **Insane Coders** from your esteemed college. The 4 member team of **Oveshahmed Patel, Janhavi Zarapkar, Mohnish Nathani and Girish Salunke** submitted a comprehensive technology solution for enabling vaccine provenance using Blockchain and increasing vaccine adoption through Gamification.

The Jury comprising eminent industry leaders from the fields of technology, public health and health sciences especially commended the thought and technologies in their solution presentation.

We hope that the students enjoyed the experience and found it to be of value. We will remain in touch with the winners and look forward to continue to engage with your college.

Technology Consulting

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

Technology Consulting

EY
Building a better working world

They solved for a billion.

Over 1600 students from 300 colleges participated in the EY Techathon 2021 to provide solutions using Artificial Intelligence, Blockchain and Gamification for vaccinating 1.3 billion people against COVID-19.

Winners

Insane Coders
Thadomal Shahani Engineering College, Mumbai

Runner-up

Vax India Tech
Vellore Institute of Technology, Chennai

Special jury mentions

IIT Dharwad	IIT Madras	IIIT-Bangalore	IIT Guwahati
Bestfit	**TechHD**	**Chaos**	**X Æ A-12**

Eminent jury

R. Chandrashekhar, Jury Chairman, Former Telecom, Electronics and IT Secretary, GoI

Dr. Harish Iyer	**Dr. Krishna Ella**	**Luca Bertuccelli**	**Dr. Manish Pant**	**Dr. Rohini Srivathsa**
Head of Digital and Health Innovation, BMGF India	Chairman and MD, Bharat Biotech	Director, Connected Platform Solutions, Carrier Refrigeration	Chief, Health and Development, UNDP	CTO, Microsoft India

Discover ey.com/en_in/technology

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

Topics of Research undertaken at our institute:

Sr. No	List of topics
1	Models for making e-commerce and M-commerce ubiquitous and pervasive to improve National productivity in India
2	Re- energizing E-governance Practices by Integrating Mobile Technology Platform
3	Forecasting cloud computing life cycle
4	Information Communication Technologies for Entrepreneurship Incubation/ Startup Projects
5	Software engineering challenges for synchronizing enterprise resource planning and business intelligence
6	Reinventing Brick and Mortar Professional Education Directorate to ICT Enabled, Database Centered Professional Education Management Enterprise
7	Investigating Big Data Analytics in Indian Industries for Building Efficiencies
8	Transcending Information Technology Enterprises in India to Evolve as Total Solution Providers
9	Investigating Efficacy of Graphical User Interface in Indian E-Governance and M-Governance Projects
10	Investigation of Mass Customisation technique in Indian Consumer Electronic Sector
11	Forecasting and Modeling Automation in Indian IT Service Industry
12	Predicting Futuristic Quality Movements in Indian Manufacturing.
13	Modeling Futuristic E-governance Practices Leveraging Deep Learning Techniques.
14	Modeling IT Infrastructure for Construction Industries to Build Velocity, Agility and Intelligence
15	Forecasting computational paradigm on advent of quantum computing and it's effect on business processes

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

16	Blockchain Technology for building Efficiency and Velocity in Indian Judicial System
17	Capacity and Throughput Optimization of MIMO for effective communication network
18	Wireless Body Area Networks : Propagation and Antenna for UWB and MM Waves
19	Performance Enhancements of 2 tier femtocell networks
20	Configuring Efficient RF Energy Harvesting System For WSN
21	Performance evaluation and modelling of futuristic small antennas in the realm of mobile communications
22	Developing an efficient architecture and procedures for Multipath TCP in wired and wireless domain
23	“Blind Tampering Detection and Localization in Digital Images and Videos”
24	Study of Procedures for Parameter Extraction of Maximum Targets using MIMO Radar Based System
25	Re-energizing manufacturing leveraging software engineering techniques
26	Investigating the Opportunities and Challenges in E-Governance Projects by integrating Cloud Computing and Big Data Analytics
27	Content based image retrieval using deep learning
28	Intrusion Detection System using Deep Learning
29	Validation and optimization of Image Compression Algorithm
30	Hashing in digital media
31	Detection and Analysis of Defects in Fabric using Texture Properties
32	Analyzing the efficacy of machine learning techniques on climate prediction in Maharashtra region

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

33	Event Recognition using Machine Learning Technique
34	Leveraging Machine Learning Technology for efficacy in predicting crop yield of Marathwada Region
35	Investigating the process of making “Software Defined Network” Agile and Lean
36	Intuitive design of GUI in realm of e-commerce in India
37	Investigating ways and means of transforming IT service enterprise into a learning organization
38	Leveraging Digital Data Analytics for Framing Public Policies
39	Investigating the efficacy of AI techniques to forecast Indian Financial Markets
40	Self Organizing Cloud to Offer Efficiency for Big Data
41	Modelling Novel Framework for Next Generation Big Data Analysis
42	Modelling cloud computing integration in Indian E-governance projects
43	Title of the Proposal Augmenting Indian Agricultural Research Using Deep Learning Techniques
44	Productivity improvement in agriculture using deep learning
45	Brain Tumor Segmentation and Analysis using Deep Learning
46	Information and Communication Technologies and Data Mining
47	Investigation of IOT based an adoptive e-health solution in the realm of disaster mitigation techniques
48	Investigating and Modelling a Recommender System: A Usability Engineering Perspective
49	Investigating Efficacies of Mobile Cloud Technology in Education Sector

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

50	Investigation and digitation of maternal health care data for knowledge discovery
51	Semantic information extraction for handwritten devanagari script documents
52	Investigating the Efficacy of Wireless Sensor Networks in the realm of Healthcare Monitoring System
53	Design and development of Improved Semantic Enhanced Personalizer(SEP) using User Navigational Behaviour Pattern and Demographics
54	Artificial Intelligence techniques for analyzing skin diseases prevalent in Mumbai Suburbs
55	Modeling Internet of Things (IoT) Embedded Converging Technologies for Healthcare
56	Leveraging Security Enabled Conversational Artificial Intelligence to Transform Healthcare.
57	Deep Learning enabled Image Analytics Techniques for cosmetic Dermopathies(Skin Diseases) prediction in the suburban areas of Mumbai & Thane
58	Big Data Analysis for Forecasting and Modelling Epidemic Outbreak
59	Big Data Analytics for Business Intelligence
60	Optimal Task Scheduling for Efficient Resource Allocation in Cloud Computing
61	Building Accuracies in Opinion Mining using various mining strategies and techniques
62	WiMAX based communication network for smart grid application
63	Artificial Intelligence driven Reinforcement of Handoff for wireless Networks

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

Details of Patent by Students:

Sr. No	Details
1	Patent Details of Year 2018
2	Patent Details of Year 2019

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

Patent by Students

Year 2018

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

Sr. No.	Year	Name of Faculty / Students	Department	Title	Application No. & Date	Date of Publication
1	2018	Dr. G T Thampi	Information Technology	Framework and process for various learning styles and learning abilities using customized instructional or learning content.	Application No.201821008914 A Date of filing of Application :12/03/2018	Publication Date : 03/01/2020
2	2018	Dr. G T Thampi	Information Technology	Framework and methodology for forecasting life cycle of digital computational and communication technologies.	Application No.201821008917 A Date of filing of Application :12/03/2018	Publication Date : 03/01/2020
3	2018	Dr. G T Thampi & Dr.Madhuri Rao	Information Technology	Intuitive Graphical User Interface Design of E-commerce using Cognitive Computing Framework	Application No.201821007909 A Date of filing of Application :03/03/2018	Publication Date : 16/03/2018
4	2018	Dr. G T Thampi & Dr.Darshan Ingle	Information Technology	Self Learning Systems and Techniques for predicting Traffic patterns	Application No.201821041086 A Date of filing of Application :31/10/2018	Publication Date : 01/05/2020

Dr. G. T. Thampi PRINCIPAL Thadomal Shahani Engineering College Bandra (W), Mumbai-400 050.

Dr. G. T. Thampi PRINCIPAL Thadomal Shahani Engineering College Bandra (W), Mumbai-400 050.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :12/03/2018

(21) Application No.201821008914 A
(43) Publication Date : 03/01/2020

(54) Title of the invention : FRAMEWORK AND PROCESS FOR VARIOUS LEARNING STYLES AND LEARNING ABILITIES USING CUSTOMIZED INSTRUCTIONAL OR LEARNING CONTENT.

(51) International classification	:H04N 7/00	(71)**Name of Applicant :** **1)DR. THAMPI GOPAKUMARAN T.** Address of Applicant :THADOMAL SHAHANI ENGINEERING COLLEGE, P. G. KHER MARG, TPS III, OFF LINKING ROAD, BANDRA (WEST), MUMBAI-400 050, MAHARASHTRA, INDIA. Maharashtra India **2)DR. ADAMUTHE AMOL CHANDRAKANT**
(31) Priority Document No	:NA	
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	(72)**Name of Inventor :** **1)DR. THAMPI GOPAKUMARAN T.** **2)DR. ADAMUTHE AMOL CHANDRAKANT**
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
The present invention relates to digital communication and computational technologies driven processes in the realm of education and training of human capital. More specifically the present invention relates to mass customization of learning content/instructional content based upon cognitive load theories underpinning cultural and historical conditioning of learners of different nation states/market place/geographical entities in which learners brought up. The pervasive ubiquitous Information Communication Technologies are getting leverage to create massively customized learning content based upon the varying learning styles and learning abilities (rate of learning/internalization). Machine learning/augmented/virtual reality techniques are used as a productive and resource & force multiplying tools to have an effective learning experience. These learning/instructional contents are offering cost and quality arbitrage in comparison with existing ICT enabled learning content and procedures in the educational/training market place.

No. of Pages : 9 No. of Claims : 9

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :12/03/2018

(21) Application No.201821008917 A
(43) Publication Date : 03/01/2020

(54) Title of the invention : FRAMEWORK AND METHODOLOGY FOR FORECASTING LIFE CYCLE OF DIGITAL COMPUTATIONAL AND COMMUNICATION TECHNOLOGIES.

(51) International classification :H04W74/08H04W72/12
(31) Priority Document No :NA
(32) Priority Date :NA
(33) Name of priority country :NA
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)**Name of Applicant :**
1)DR. THAMPI GOPAKUMARAN T.
Address of Applicant :THADOMAL SHAHANI ENGINEERING COLLEGE, P. G. KHER MARG, TPS III, OFF LINKING ROAD, BANDRA (WEST), MUMBAI-400 050, MAHARASHTRA, INDIA. Maharashtra India
2)DR. ADAMUTHE AMOL CHANDRAKANT
(72)**Name of Inventor :**
1)DR. THAMPI GOPAKUMARAN T.
2)DR. ADAMUTHE AMOL CHANDRAKANT

(57) Abstract :
This invention is in the field of prediction and forecasting of natural life cycles of products and processes and more particularly to forecasting life cycle of technologies. More specifically the invention related to framework and methodology for forecasting life cycle of digital computational and communication technologies. More specifically the present invention is from technologist point of view where direct application of principles and theories from multiple fields of science and engineering are integrated for forecasting life cycle of technologies. It provides framework and methodology for simple, easy to use, objective and more accurate forecasting of technology life cycle.

No. of Pages : 14 No. of Claims : 7

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.

(12) PATENT APPLICATION PUBLICATION
(21) Application No.201821007909 A
(19) INDIA
(22) Date of filing of Application :03/03/2018
(43) Publication Date : 16/03/2018

(54) Title of the invention : INTUITIVE GRAPHICAL USER INTERFACE DESIGN OF E-COMMERCE USING COGNITIVE COMPUTING FRAMEWORK

(51) International classification	:G01C 23/00 G06T 11/00	(71)**Name of Applicant :** **1)Ms. Megharani T. Patil** Address of Applicant :Thadomal Shahani Engineering College, Bandra(West), Mumbai, 400050 Maharashtra India **2)Dr. Madhuri Y. Rao** **3)Dr. G. T. Thampi**
(31) Priority Document No	:NA	
(32) Priority Date	:NA	
(33) Name of priority country	:NA	(72)**Name of Inventor :** **1)Ms. Megharani T. Patil** **2)Dr. Madhuri Y. Rao** **3)Dr. G. T. Thampi**
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
Present invention provides specially an intuitive GUI design of e-commerce using cognitive computing framework to develop a template for virtual e-commerce website suitable for heterogeneous users. The invention carried out stepwise template development for an intuitive virtual e-commerce shopping website. We began with documenting a mental model and the behavioral pattern of users and this assisted us to figure out the gaps between their current knowledge and target knowledge. Based on this understanding, design procedures were formed and eventually, those are reflected in a prototype of an intuitive virtual e-commerce shopping site. The prototype is validated with standard methods. Finally, the template is formed. The contribution of features such machine learning and artificial intelligence is shown by introducing a case study on Demographic content-based collaborative recommendation system framework, Navigation optimization through modified prefix span algorithm and Review summarization using Gibbs sampling based Latent Dirichlet Allocation classifier which have reduced human efforts and increased user satisfaction level. In this way, machine learning & artificial intelligence have contributed in designing intuitive interfaces for e-commerce shopping sites. Additional contribution to make e-commerce website more intuitive is demonstrated by another case study redesigning ICONs of an e-commerce online banking websites to make it more users friendly.

No. of Pages : 25 No. of Claims : 7

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :31/10/2018

(21) Application No.201821041086 A
(43) Publication Date : 01/05/2020

(54) Title of the invention : SELF-LEARNING SYSTEMS AND TECHNIQUE FOR PREDICTING TRAFFIC PATTERNS.

(51) International classification	:H04N 19/593
(31) Priority Document No	:NA
(32) Priority Date	:NA
(33) Name of priority country	:NA
(86) International Application No	:NA
Filing Date	:NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number	:NA
Filing Date	:NA
(62) Divisional to Application Number	:NA
Filing Date	:NA

(71)**Name of Applicant :**
1)DR. THAMPI GOPAKUMARAN T
Address of Applicant :THADOMAL SHAHANI ENGINEERING COLLEGE, P. G. KHER MARG, TPS-III, OFF. LINKING ROAD, BANDRA(W), MUMBAI, MAHARASHTRA, INDIA. PIN CODE: 400050 Maharashtra India
2)DARSHAN INGLE
(72)**Name of Inventor :**
1)DR. THAMPI GOPAKUMARAN T
2)DARSHAN INGLE

(57) Abstract :
The current road traffic estimation is swiftly done by Google maps. However, it takes into consideration only the current real-time data. This patent will facilitate the users of the country thereby reducing their traveling time. It analyzes the traffic data at the traffic signal using its microcontroller unit, GPS data and Regression using Deep Learning approach to modulate the traffic signal timers for a fine tuning the traffic. The developed system will be trained using the data from past records so that it can make decision based on past records as well as the current traffic data.

No. of Pages : 9 No. of Claims : 8

Patent by Students

Year 2019

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

Sr. No.	Year	Name of Faculty / Students	Department	Title	Application No. & Date	Date of Publication
1	2019	Dr. Ashwini Kunte	Electronics & Telecommunication	Antenna for RF Energy harvesting System	Application No..201921001338 A Date of filing of Application : 11/01/2019	Publication Date : 25/01/2019
2	2019	Dr. Ashwini Kunte	Electronics & Telecommunication	Meta materials for miniaturization and Bandwidth improvement of micro strip patch antenna.	Application No.201921009985 A Date of filing of Application : 14/03/2019	Publication Date : 29/03/2019

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai-400 050.

(12) PATENT APPLICATION PUBLICATION
(21) Application No.201921001338 A
(19) INDIA
(22) Date of filing of Application :11/01/2019
(43) Publication Date : 25/01/2019

(54) Title of the invention : ANTENNA FOR RF ENERGY HARVESTING SYSTEM

(51) International classification	:H01Q 9/00 H01Q 1/00	(71)**Name of Applicant :** **1)Mamta Kurvey** Address of Applicant :B201, Harmony tower, Siddheshwar Garden, Dhokali, Thane - W. 400607 Maharashtra India
(31) Priority Document No	:NA	(72)**Name of Inventor :**
(32) Priority Date	:NA	**1)Mamta Kurvey**
(33) Name of priority country	:NA	**2)Dr. Ashwini Kunte**
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
An apparatus for harvesting RF energy comprising a monopole antenna, a matching network, a rectifier circuit, a storage device, wherein the antenna monopole is rectangular in shape having three steps on the upper portion, two step in the lower portion, a feedline in the lower portion which may be placed at the left, centre or right of the monopole and the monopole having transversal or longitudinal or combination of transversal or longitudinal slots either singly or in plurality. Fig 1

No. of Pages : 15 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :14/03/2019

(21) Application No.201921009985 A
(43) Publication Date : 29/03/2019

(54) Title of the invention : METAMATERIALS FOR MINIATURIZATION AND BANDWIDTH IMPROVEMENT OF MICROSTRIP PATCH ANTENNA.

(51) International classification	:H01Q 9/00 H01Q 1/00	(71)**Name of Applicant :** **1)Mrs. BHAVNA DHANANJAY THAKUR** Address of Applicant :604, BUILDING-14, HIGHLAND RESIDENCY, DHOKALI, THANE WEST-400607, MAHARASHTRA, INDIA Maharashtra India
(31) Priority Document No	:NA	
(32) Priority Date	:NA	(72)**Name of Inventor :**
(33) Name of priority country	:NA	**1)Mrs. BHAVNA DHANANJAY THAKUR**
(86) International Application No	:NA	**2)Dr. ASHWINI KUNTE**
Filing Date	:NA	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :
Provided is a microstrip patch antenna device in which an array of metamaterial dielectric inclusions comprising of complementary ELC resonators are embedded in the conductive ground plane of the patch antenna for miniaturization and bandwidth improvement of the microstrip patch antenna. The microstrip patch antenna device comprises of a dielectric substrate102, with a upper layer of rectangular conductive radiating element103, a lower layer of conductive ground plane101below the dielectric substrate, an array of metamaterial dielectric inclusions embedded in the lower layer of conductive ground plane and a microstrip feed line104 that lies on the dielectric substrate and is connected with the rectangular conductive radiating plate. The miniaturized antenna is invented for wireless communication, especially for the Wi-Max band.

No. of Pages : 15 No. of Claims : 10

Dr. G. T. Thampi
PRINCIPAL
Thadomal Shahani Engineering College
Bandra (W), Mumbai - 400 050.