

**SPIRO SOLUTIONS PVT LTD**  
**T.NAGAR, CHENNAI-17.**

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## SPIRO PROJECT TITLES 2019 – 2020

<b>EMBEDDED SYSTEMS</b>			
<b>ARDUINO</b>			
S.NO	PROJECT CODE	TITLE	YEAR
1	ITAUR01	NRF Based Vehicle Accident Reduce System	2019
2	ITAUR02	Design of Bus tracking and Fuel Monitoring system	2019
3	ITAUR03	Wireless Communication Systems And Health Monitoring System For Mine Areas	2019
4	ITAUR04	Centralized System For Emergency Vehicle Passing With Authentication	2019
5	ITAUR05	An Intelligent Universal Remote Control System For Home Security	2019
6	ITAUR06	Autonomous Way Detection For Visually Challenged Using Machine Learning Algorithm	2019
7	ITAUR07	Design & Development Of Security Based Voting System	2019
8	ITAUR08	Arduino Based Tomato Ripening Stages Monitoring System	2019
9	ITAUR09	Real-Time Monitoring And Control For Green House Based On Wireless Sensor Network	2019

## SPIRO PROJECT TITLES 2019 – 2020

10	ITAUR10	RF Controlled Mine Detecting Robot	2019
11	ITAUR11	IOT Based Smart Vehicle Safety System Using Arduino	2019
12	ITAUR12	A Wireless Surveillance And Safety System For Mine Workers Based On Zigbee	2019
13	ITAUR13	Arduino Using Novel Approach For Communication Among Blind, Deaf And Dumb People	2019
14	ITAUR14	Direct Sensing Two-Axis Solar Tracking System With Voltage Monitoring	2019
15	ITAUR15	IOT Based Weather Station And Agricultural Land Monitoring With Dry Leaf Detection Using Matlab And Arduino	2019
16	ITAUR16	Smart Speaking Glove For Speech Impaired People	2019
17	ITAUR17	Smart Device For Water Management	2019
18	ITAUR18	Smart Restaurant Using Arduino	2019
19	ITAUR19	Iot Based Multisensory System To Enhance Railway Safety	2019
20	ITAUR20	Speech Controlled Robot For Intelligent Irrigation	2019

## SPIRO PROJECT TITLES 2019 – 2020

RASPBERRY PI			
21	ITRP01	Touchscreen Controlled Multi-Purpose Spy Robot Using Bluetooth	2019
22	ITRP02	Smart Parking System For IOT	2019
23	ITRP03	IOT Based Low End Automotive Drive Recorder And Surveillance System	2019
24	ITRP04	Class Attendance System Using Raspberry Pi	2019
25	ITRP05	Smart Product Delivery System	2019
26	ITRP06	Design And Construction Of Electronic Aid For Visually Impaired People Tensor Flow	2019
27	ITRP07	Hardware Steganography Using Digital Photo Frame	2019
28	ITRP08	Intelligent Automatic Decision Making Car Parking And Slot Allocation Management System Using Raspberry Pi	2019
29	ITRP09	IOT Based Interactive Smart Refrigerator	2019
30	ITRP010	Smart Mosquito Killing System	2019
31	ITRP011	Smart Door Security Method Using Open CV	2019
32	ITRP012	IOT Based Gas Pipe Leakage System	2019

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33	ITRP013	Telegram Enabled Smart Door Security System Using Raspberry Pi	2019
34	ITRP014	Smart Rationing System Using RFID And Raspberry Pi	2019
35	ITRP015	Smart Home Garden Irrigation System Using Raspberry Pi	2019
<b>INTERNET OF THINGS</b>			
36	ITIOT01	IOT Enabled Green House	2019
37	ITIOT02	IOT Based Traffic Congestion Monitoring And Controlling System	2019
38	ITIOT03	IOT Enabled Smart Lighting Intelligent And Weather Adaptive Lighting In Street Lights	2019
39	ITIOT04	Advance Automatic Toll Collection And Vehicle Detection During Collision Using IOT	2019
40	ITIOT05	Air And Sound Monitoring System in Medical sector Using IOT	2019
41	ITIOT06	IOT Based Coal Mine Safety Monitoring And Controlling	2019
42	ITIOT07	IOT Based Energy Meter Reading	2019
43	ITIOT08	Implementation Of IOT Based Antenna Positioning System	2019
44	ITIOT09	IOT Based Aquarium Monitoring And Controlling System	2019

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45	ITIOT10	IOT Based Bridge Safety Monitoring System	2019
46	ITIOT11	Gas Leakage Detection And Prevention Kit Provision With IOT	2019
47	ITIOT12	Smart Home Automation And Security System Using Arduino And IOT	2019
48	ITIOT13	IOT Application On Secure Smart Shopping System	2019
49	ITIOT14	Smart Garbage Monitoring System Using IOT	2019
50	ITIOT15	IOT Based Smart Black Box System	2019
51	ITIOT16	Protection For Women Using IOT Smart Device With Location And Parameters	2019
52	ITIOT17	Smart Driver Chair For Four Wheeler Using IOT	2019
53	ITIOT18	Smart And Intelligent Field Irrigation System IOT	2019
54	ITIOT19	IOT Based Industrial Pollution Monitoring	2019
55	ITIOT20	IOT Based Smart Poultry Farm	2019
56	ITIOT21	Smart Railway Gate System Using IOT	2019
57	ITIOT22	IOT Based Vehicle License Tracking And Theft Detection Using Arduino	2019
58	ITIOT23	IOT Based Smart Street Light And Traffic Management Using Arduino	2019
59	ITIOT24	Elephant Warning System Using IOT	2019

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60	ITIOT25	Dynamic Power Management Of Household Energy Consumables Using IOT	2019
<b>LIGHT FIDELITY</b>			
61	ITLI01	Indoor Localization Using Visible Light Communication For Blind People	2019
62	ITLI02	Audio Transmission Using Li-Fi Technology	2019
63	ITLI03	Real Time Text transmission Implemented For Underwater Wireless Communication Using Li-Fi	2019
64	ITLI04	Collision Avoidance Between Vehicles Through Li-Fi Based Communication System	2019
65	ITLI05	Highway Navigation System Using Light Fidelity	2019
66	ITLI06	Smart Billing Trolley Using RFID & Li-Fi	2019
67	ITLI07	Machine to Machine Data Transmission Through Light Fidelity	2019
68	ITLI08	Li-Fi Based Modern Home Automation	2019
<b>RSSI</b>			
69	ITRSSI01	Rssi Based Indoor Localization And Identification Of Zigbee Wireless Sensor Network In Smart Home	2019
70	ITRSSI02	A System For Detection And Tracking Of Human Movements Using Rssi Signals	2019



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71	ITRSSI03	Accident Prevention And Emergency Awareness Using Augmented Reality	2019
72	ITRSSI04	Location Monitoring System For Maritime Security Using Rssi Technology	2019
73	ITRSSI05	Rssi Based Implementation Of Smart Tollgate Automation	2019
74	ITRSSI06	Personal Assistant For Visually Impaired People In Malls	2019
75	ITRSSI07	Prisoner Localization And Escape Prevention Inside The Prison	2019
76	ITRSSI08	Child Safety System Using Wearable Device Based On Rssi System	2019
77	ITRSSI09	Smart Way To Catch The Theft Vehicle And Theft Person	2019
78	ITRSSI10	Smart Way To Leave The Space For Ambulance By Using Rssi	2019
79	ITRSSI11	Preventing School Students In Accident By Using Rssi	2019
80	ITRSSI12	Boat Localization And Warning System For Border Identification	2019
81	ITRSSI13	Rssi Based Sand Theft Prevention System	2019



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82	ITRSSI14	Control The Speed Of The Vehicle To Avoid Road Accident By Using Rssi	2019
83	ITRSSI15	Rssi Based Children Safety System In School Zone	2019
<b>ROBOTICS</b>			
84	ITROB01	Automated Multilevel Car Parking System	2019
85	ITROB02	Rfid Based Autonomous Mobile Controlled Robot	2019
86	ITROB03	Pipe-Crawling Robot	2019
87	ITROB04	Obstacle Avoidance Mobile Controlled Robot	2019
88	ITROB05	Automatic Land-Mine Detection Robot Using Wireless Technologies	2019
89	ITROB06	Distributed Traffic Regulations Using Robot	2019
90	ITROB07	Magnetic Crawling Robot	2019
91	ITROB08	Autonomous Vehicle In Obstacle Free Environment	2019
92	ITROB09	Automated Car Parking With Empty Slot Detection	2019
93	ITROB10	RFID Based Automated Dispatching System	2019
94	ITROB11	GSM Enabled Autonomous Vehicle Controlling	2019

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95	ITROB12	A Fully Automated Lawn Mower Using Solar Panel	2019
96	ITROB13	Design Of An IOT Based Autonomous Vehicle With The Aid Of Computer Vision	2019
97	ITROB14	Smart Solar Grass Cutter Robot	2019
98	ITROB15	Weedicide Spray Robot Using Image Processing	2019
<b>GSM &amp; GPS</b>			
99	ITGP01	Vehicle Monitoring And Tracking System Using GPS And GSM	2019
100	ITGP02	GPS And GSM Based Healthcare Monitoring System	2019
101	ITGP03	Self-Regulating Line Fault Detection and Its Location In Transmission Lines	2019
102	ITGP04	An Intelligent Fire Monitoring And Alleviation System Using GSM	2019
103	ITGP05	Anti-Theft Protection Of Vehicle By Using GSM With Fingerprint Verification	2019
104	ITGP06	SMS Based Alerting System For Train Passengers	2019

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105	ITGP07	Speed Detecting And Reporting System Using GPS And GSM	2019
106	ITGP08	Smart On-Board Vehicle Monitoring System Using GPS And GSM	2019
107	ITGP09	GSM Based Driver Assistance System In Night Time Driving	2019
108	ITGP10	Automatic Oil Tank Truck Alarm System For Fuel Theft Prevention	2019
109	ITGP11	Smart Classroom Controlled By GSM	2019
110	ITGP12	GSM Based Secure Voting System Using Biometrics	2019
111	ITGP13	Truck Weighing Based On The Suspension Of The Vehicle	2019
112	ITGP14	ATM Security Using GSM And MEMS Sensor	2019
113	ITGP15	Disaster Detection And Early Warning System	2019
<b>BIOMEDICAL</b>			
114	ITBIO01	Smart Tiles For Elder Tracking And Fall Detection System	2019
115	ITBIO02	A Secure Li-Fi Modern Healthcare System Using Body Sensor Network	2019

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116	ITBIO03	Medical Smart Card System For Patient Record Management	2019
117	ITBIO04	Health Care Monitoring And Tracking System Using GPS And GSM	2019
118	ITBIO05	Automated Detection Of White Blood Cells Cancer Diseases Updated In IOT	2019
119	ITBIO06	Fabrication Of Biometric Automated Pill Dispenser	2019
120	ITBIO07	Cloud Based Baby Incubator Monitoring And Emergency Alarm System	2019
121	ITBIO08	Detection Of Driver Drowsiness And Controlling The Vehicle Using Arduino	2019
122	ITBIO09	Automatic Anesthesia Injector Using Arduino	2019
123	ITBIO10	Automated Paralysis Patient Health Care Monitoring System	2019
124	ITBIO11	Health Monitoring System For Comatose Patient	2019
125	ITBIO12	Optical Based No Invasive Glucometer Monitoring Using IOT	2019

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126	ITBIO13	Smart Sensory Furniture Using Arduino	2019
127	ITBIO14	IOT Enabled Wake Up Stroke Using Arduino	2019
128	ITBIO15	An Energy Efficient Sensor For Thyroid Monitoring	2019
129	ITBIO16	Supervised Saliency Map Driven Segmentation Of Lesions In Dermoscopic Images	2019
130	ITBIO17	Anatomical Retinal Structure Segmentation System For Automatic Eye Screening Using Morphological Fuzzy Threshold	2019
131	ITBIO18	Smart Medication And Monitoring System For Secure Using IOT	2019
<b>WIRELESS</b>			
132	ITWI01	Bus Arrival Information System For Passenger	2019
134	ITWI02	Early Flood Detection And Monitoring System Based On Wireless Sensor Network	2019
135	ITWI03	Smart Guide Stick For Blind Using Zigbee	2019
136	ITWI04	Crane Control By Using Hand Gestures	2019
137	ITWI05	Remotely Monitoring Health Of The Solar Power System Using Arduino	2019

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<b>WIRELESS POWER TRANSFER</b>			
138	ITWT01	Wireless Charging Of Electric Vehicle	2019
139	ITWT02	Wireless Power Transmission For A Traveling Mobility Scooter	2019
140	ITWT03	Acoustic Wireless Power Transfer With Receiver Array For Enhanced Performance	2019
141	ITWT04	Wireless Based Power Transmission Using Impedance Matching	2019
142	ITWT05	Analysis And Design Of Inductive Power Transmission System Employing Out Of Band Wireless Feedback Link	2019
<b>MECHANISM</b>			
143	ITEM01	Automatic Farming Robot For Smart And Effective Cultivation	2019
144	ITEM02	Automatic T-Shirt Folding Machine	2019
145	ITEM03	Design And Fabrication Of Smart Board Cleaner	2019
146	ITEM04	Smart Water Tank Cleaning Machine For House Hold Applications	2019
147	ITEM05	Intelligent Wheelchair For Handicapped Persons	2019

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MATLAB-IMAGE PROCESSING			
MEDICAL IMAGE PROCESSING			
148	ITIMP01	Machine-Learning Approach Based Gamma Distribution for Brain Abnormalities Detection and Data Sample Imbalance Analysis	2019
149	ITIMP02	Comparative Analysis of Segmentation techniques for Progressive Evaluation and Risk Identification of Diabetic Foot Ulcers	2019
150	ITIMP03	Computer-assisted Acute Lymphoblastic Leukemia detection and diagnosis	2019
151	ITIMP04	Cervical Histopathology Image Classification Using Multilayer Hidden Conditional Random Fields and Weakly Supervised Learning	2019
152	ITIMP05	Classification of Melanoma and Nevus in Digital Images for Diagnosis of Skin Cancer	2019
153	ITIMP06	Detecting Alzheimer’s Disease on Small Dataset: A Knowledge Transfer Perspective	2019
154	ITIMP07	Hookworm Detection in Wireless Capsule Endoscopy images	2018
155	ITIMP08	Supervised Saliency Map Driven Segmentation of Lesions in Dermoscopic Images	2018
156	ITIMP09	Fundus Images-Based Detection and Grading of Macular Edema Using Robust Macula Localization	2018



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157	ITIMP10	Classification of Cell Types In Acute Myeloid Leukemia (AML) of M4,M5 and M7 Subtypes With Support Vector Machine Classifier	2018
<b>IMAGE ENHANCEMENT</b>			
158	ITIMP11	Detail-preserving underexposed image enhancement via optimal weighted multi-exposure fusion	2019
159	ITIMP12	Single Image Haze Removal via Region Detection Network	2018
160	ITIMP13	A Review on Intelligence Dehazing and Color Restoration for Underwater Images	2018
161	ITIMP14	Improved Dark Channel Prior for Image Defogging using RGB and YCbCr Color Space	2018
162	ITIMP15	High dynamic range imaging for cloud segmentation	2018
<b>MACHINE LEARNING</b>			
163	ITIMP16	Attention-Based Two-Stream Convolutional Networks for Face Spoofing Detection	2019
164	ITIMP17	Human edge segmentation from 2D images by its Histogram of oriented gradient and edge matching algorithms	2019
165	ITIMP18	Toward Resolution-Invariant Person Re identification via Projective Dictionary Learning	2019
166	ITIMP19	Action-Stage Emphasized Spatio-Temporal VLAD for Video Action Recognition	2019

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167	ITIMP20	Topology Preserving Structural Matching for Automatic Partial Face Recognition	2018
168	ITIMP21	Robust Feature-Based Automated Multi-View Human action Recognition System	2018
<b>IMAGE SEGMENTATION</b>			
169	ITIMP22	An Optimized Method for Segmentation and Classification of Apple Diseases based on Strong Correlation and Genetic Algorithm based Feature selection	2019
170	ITIMP23	Dual Step Strategy for Retinal Thin Vessel Enhancement/Extraction	2019
171	ITIMP24	Machine Vision based Traffic Sign Detection Methods: Review, Analyses and Perspectives	2019
172	ITIMP25	Glaucoma Detection Using Fundus Images Of The Eye	2019
173	ITIMP26	Brain image segmentation based on FCM clustering algorithm	2019
174	ITIMP27	A novel weakly supervised Multitask Architecture for Retinal Lesions Segmentation on Fundus Images	2019
175	ITIMP28	Segmentation of periodical Dental X-ray images by applying morphological operation	2018
176	ITIMP29	Structure preserving guided retinal image filtering and its application for optic disc analysis	2018
177	ITIMP30	An algorithm for concrete crack extraction and identification based on machine vision	2018

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178	ITIMP31	Detecting Diabetes Mellitus Gradient Vector Flow Tongue Segmented Technique	2018
<b>STEGANOGRAPHY</b>			
179	ITIMP33	New Payload Partition Strategy in Color Image Steganography	2019
180	ITIMP34	Cryptanalysis and enhancement an image encryption scheme based on bit plane extraction and multiple chaotic maps	2019
181	ITIMP35	Secure and robust digital image watermarking using coefficient differencing and chaotic encryption	2018
182	ITIMP36	An Efficient MSB Prediction-Based Method for High Capacity Reversible Data Hiding in Encrypted Images	2018
<b>BIOMETRICS</b>			
183	ITIMP37	Survey on Face Expression Recognition using CNN	2019
184	ITIMP38	Characterizing and evaluating adversarial examples for Offline Handwritten Signature Verification	2019
185	ITIMP39	Application of Statistical Data Processing for Solving the Problem of Face Recognition by Using Principal Component Analysis Method	2019
186	ITIMP40	Morphology-based Banknote Fitness Determination	2019
187	ITIMP41	Normalization and weighting Techniques Based on Genuine-impostor Score Fusion in Multi-biometric Systems	2018

## SPIRO PROJECT TITLES 2019 – 2020

AUDIO PROCESSING			
188	ITIMP42	Curriculum Learning for Speech Emotion Recognition From Crowd sourced Labels	2019
189	ITIMP43	Emotionally relevant features for classification and regression of music lyrics	2018
190	ITIMP44	Connecting Subspace Learning and Extreme Learning Machine in Speech Emotion Recognition	2018
191	ITIMP45	Emotion Recognition In Speech Using MFCC With SVM,DSVM and Auto-encoder	2018
ARDUINO WITH MATLAB			
192	ITIMP46	Web Camera Primarily based Face Recognition Victimization VIOLA JONE’S Rule with Arduino Uno	2019
193	ITIMP47	Fruit Quality Inspection System Using Image Processing	2019
194	ITIMP48	Intelligent irrigation management and monitoring system using arduino	2019
195	ITIMP49	Illumination and scale invariant relevant visual features with hyper graph-based learning for multi-shot person re- identification	2019
196	ITIMP50	Smart Stick Design With Obstacle Detection And Navigation As The Helping Tool For Blind People	2019
197	ITIMP51	Smart Traffic density Control using Image Processing	2019
198	ITIMP52	Indian Traffic Signboard Recognition and Driver Alert System Using Machine Learning	2019

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199	ITIMP53	Accident Detection And Monitoring System Using Arduino Uno	2019
200	ITIMP54	Open-source Arduino-compatible data loggers designed for field research	2019
201	ITIMP55	Design of Weather Monitoring System Using Arduino Uno	2019
<b>RASPBERRY PI WITH MATLAB</b>			
202	ITIMP56	Optical Character Recognition For Blind Using Raspberry Pi	2019
203	ITIMP57	Blind Reader Using Raspberry Pi	2019
204	ITIMP58	Classroom Attendance Using Face Detection and Raspberry Pi	2019
205	ITIMP59	Face recognition based door unlocking system using Raspberry Pi	2019
206	ITIMP60	Vehicle Number Plate Detection Using Matlab	2019
207	ITIMP61	Real-Time Home Security Using Raspberry Pi	2019
208	ITIMP62	Self-Driving Car using Raspberry-Pi and Machine Learning	2019
209	ITIMP63	RFID Based Theft Detection and Vehicle Monitoring System using Raspberry Pi	2019
210	ITIMP64	Vehicle Seat Vacancy Identification using Image Processing Technique	2019
211	ITIMP65	Thing speak Based Monitoring System for Counting People in A Library	2019

## SPIRO PROJECT TITLES 2019 – 2020

<b>MATLAB COMMUNICATION</b>			
<b>ORTHOGONAL FREQUENCY-DIVISION MULTIPLEXING(OFDM)</b>			
S.NO	PROJECT CODE	TITLE	YEAR
254	ITCM01	OFDM-OAM Modulation for Future Wireless Communications	2019
255	ITCM02	A Power and Spectrum Efficient NOMA Scheme for VLC Network Based on Hierarchical Pre-Distorted LACO-OFDM	2019
256	ITCM03	GFDM Based Wireless Powered Communication for Cooperative Relay System	2019
257	ITCM04	Spectral Efficiency Enhancement Based on Sparsely Indexed Modulation for Green Radio Communication	2019
258	ITCM05	Orthogonal Projection With Optimized Reserved Subcarriers Mapping for Side lobe Suppression in OFDM Systems	2019
259	ITCM06	Reduction of PAPR Without Side Information for SFBC MIMO-OFDM Systems	2018
260	ITCM07	Low Complexity ZF Receiver Design for Multi-User GFDM Uplink Systems	2018
261	ITCM08	Successive Multipath Interference Cancellation for CP-Free OFDM Systems	2018



## SPIRO PROJECT TITLES 2019 – 2020

COGNITIVE RADIO NETWORK(CRN)			
262	ITCM09	A Homogeneous Multi-Radio Rendezvous Algorithm for Cognitive Radio Networks	2019
263	ITCM10	Hybrid Fuzzy Logic Scheme for Efficient Channel Utilization in Cognitive Radio Networks	2019
264	ITCM11	Resource Allocation in Heterogeneous Cognitive Radio Network with Non-orthogonal Multiple Access	2019
265	ITCM12	Outage Probability for Cooperative NOMA Systems With Imperfect SIC in Cognitive Radio Networks	2019
266	ITCM13	NSAC: A Novel Clustering Protocol in Cognitive Radio Sensor Networks for Internet of Things	2019
267	ITCM14	A Joint Optimization Framework for Energy Harvesting based Cooperative CR Networks	2019
268	ITCM15	Joint Resource Allocation for OFDM-Based Cognitive Two-Way Multiple AF Relays Networks with Imperfect Spectrum Sensing	2018
269	ITCM16	QoS Aware Power Allocation and User Selection in Massive MIMO Underlay Cognitive Radio Networks	2018
270	ITCM17	Cognitive MIMO Two-Way Relay Network: Joint Optimal Relay Selection and Spectrum Allocation	2018
271	ITCM18	Optimization or Alignment: Secure Primary Transmission Assisted by Secondary Networks.	2018



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<b>MULTIPLE INPUT MULTIPLE OUTPUT(MIMO)</b>			
272	ITCM19	Transceiver Design with UCD-Based Hybrid Beam forming for Millimeter Wave Massive MIMO	2019
273	ITCM20	Periodic Analog Channel Estimation Aided Beam forming for Massive MIMO Systems	2019
274	ITCM21	Wireless Power Transfer by Beam space Large-scale MIMO with Lens Antenna Array	2019
275	ITCM22	Efficient User Clustering, Receive Antenna Selection, and Power Allocation Algorithms for Massive MIMO-NOMA Systems	2019
276	ITCM23	Novel MIMO Detection With Improved Complexity for Near-ML Detection in MIMO-OFDM Systems	2019
277	ITCM24	Generalized Approximate Message Passing for Massive MIMO mm Wave Channel Estimation with Laplacian Prior	2019
278	ITCM25	Artificial Noise Aided Secure Cognitive Beam forming for Cooperative MISO-NOMA Using SWIPT	2018
279	ITCM26	Secure Beam former Designs in MU-MIMO Systems with Multiuser Interference Exploitation	2018
<b>OPTICAL COMMUNICATION</b>			
280	ITCM27	Optical Adaptive Antenna Array for Multiuser Mobile Optical Communication	2019
281	ITCM28	Comparison of Optical OFDM and M-PAM for LED-Based Communication Systems	2019

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282	ITCM29	Interference-Free Hybrid Optical OFDM with Low-Complexity Receiver for Wireless Optical Communications	2019
283	ITCM30	Achievable Rates of Multi-Carrier Modulation Schemes for Bandlimited IM/DD Systems	2019
<b>RELAY-COMMUNICATION</b>			
284	ITCM31	Effective Resource Utilization Schemes for Decode-and-Forward Relay Networks With NOMA	2019
285	ITCM32	Joint Relay and Eavesdropper Selection Strategy Against Multiple Eavesdroppers over Nakagami-m Fading Channels in Cooperative Decode-and-Forward Relay Networks	2019
286	ITCM33	Simultaneous Wireless Information and Power Transfer in Cellular Two-Way Relay Networks With Massive MIMO	2018
<b>SATELLITE COMMUNICATION</b>			
287	ITCM34	Joint Beamforming and Power Allocation for Satellite-Terrestrial Integrated Networks with Non-Orthogonal Multiple Access	2019
288	ITCM35	Robust Secure Beamforming for Multibeam Satellite Communication Systems	2019
289	ITCM36	Joint Beamsforming for Secure Communication in Cognitive Satellite Terrestrial Networks	2018

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290	ITCM37	Physical Layer Security of Interference-Limited Land Mobile Satellite Communication Systems	2018
<b>ACOUSTIC COMMUNICATION</b>			
291	ITCM38	Deep Learning Based Single Carrier Communications Over Time-Varying Underwater Acoustic Channel	2019
292	ITCM39	Hybrid Carrier Underwater Acoustic Communication Based on Joint Time-Frequency Domain Equalization	2019
293	ITCM40	Eigen decomposition -Based Partial FFT Demodulation for Differential OFDM in Underwater Acoustic Communications	2018

## SPIRO PROJECT TITLES 2019 – 2020

POWER ELECTRONICS			
RENEWABLE ENERGY			
SOLAR ENERGY			
294	ITPW01	Novel High Gain, High Efficiency DC–DC Converter Suitable for Solar PV Module Integration With Three-Phase Grid Tied Inverter	2019
295	ITPW02	Mitigation of Inter harmonics in PV Systems with Maximum Power Point Tracking Modification	2019
296	ITPW03	Design and Hardware Implementation Considerations of Modified Multilevel Cascaded H-Bridge Inverter for Photovoltaic System	2019
297	ITPW04	PWM Plus Phase-Shift Modulated Three-Port Three-Level Soft-Switching Converter Using GaN Switches for Photovoltaic Applications	2019
298	ITPW05	Dynamic Power Management System Employing Single Stage Power Converter for Standalone Solar PV Applications	2018
299	ITPW06	PV-Battery Series Inverter Architecture: A Solar Inverter for Seamless Battery Integration with Partial-Power DC-DC Optimizer	2018
300	ITPW07	Enhanced Bayesian Based MPPT Controller for PV Systems	2018
301	ITPW08	MPPT in Dynamic Condition of Partially Shaded PV System by using WODE Technique	2018

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302	ITPW09	An Enhanced Adaptive P&O MPPT for Fast and Efficient Tracking Under Varying Environmental Conditions	2018
<b>WIND ENERGY</b>			
303	ITPW10	Position Sensor-less Synchronous Reluctance Generator Based Grid-Tied Wind Energy Conversion System with Adaptive Observer Control	2019
304	ITPW11	Grid-Connected Wind-Photovoltaic Cogeneration Using Back-to-Back Voltage Source Converters	2019
305	ITPW12	Highly Reliable Back-To-Back Power Converter without Redundant Bridge Arm for Doubly-Fed Induction Generator-Based Wind Turbine	2019
306	ITPW13	Control of Wind-Diesel Hybrid System with BESS for Optimal Operation	2018
<b>HYBRID ENERGY</b>			
307	ITPW14	A Modular SiC-based Step-up Converter with Soft-Switching-Assisted Networks and Internally-Coupled High-Voltage-Gain Modules for Wind Energy System with a Medium Voltage DC-Grid	2019
308	ITPW15	LMMN Based Adaptive Control for Power Quality Improvement of Grid Intertie Wind-PV System.	2019
309	ITPW16	Experimental Validation of a Three-Port Integrated Topology to Interface Electric Vehicles and Renewables with the Electrical Grid	2018

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310	ITPW17	A Supervisory Power Management System for a Hybrid Micro-grid with HESS	2018
311	ITPW18	A Composite Sliding Mode Controller for Wind Power Extraction in Remotely Located Solar PV-Wind Hybrid System	2018
<b>ENERGY STORAGE SYSTEM</b>			
312	ITPW19	A Three-port LLC resonant DC/DC converter storage systems	2019
313	ITPW20	Second Harmonic Current Reduction for a Battery-Driven Grid Interface with Three-Phase Dual Active Bridge DC/DC Converter	2019
314	ITPW21	Bidirectional Series Resonant DC/AC converter for energy storage systems	2018
315	ITPW22	Charging and Discharging Strategies of Grid- Connected Super-Capacitor Energy Storage Systems	2018
<b>AC TO DC CONVERSIONS</b>			
316	ITPW23	A Novel Current Modulation Method to Eliminate Low Frequency Harmonics in Single-Stage Dual Active Bridge AC/DC Converter	2019
317	ITPW24	Optimal Space Vector Modulation of Current Source Converter for DC-Link Current Ripple Reduction	2018
318	ITPW25	A Single-Phase Three-Level Flying-Capacitor PFC Rectifier without Electrolytic Capacitors	2018



## SPIRO PROJECT TITLES 2019 – 2020

319	ITPW26	Three-Port-Converter-Based Single-Phase Bidirectional AC-DC Converter With Reduced Power Processing Stages and Improved Overall Efficiency	2018
320	ITPW27	Bidirectional Isolated AC-DC Converter for Electric Vehicles Multifunctional Chargers	2018
<b>DC TO AC CONVERSION</b>			
321	ITPW28	An Active Power Decoupling Method for Single Phase DC/AC DAB Converters	2019
322	ITPW29	Impedance Shaping of Isolated Two-Stage AC-DC-DC Converter for Stability Improvement	2019
323	ITPW30	Bidirectional Three-Phase DC-AC Converter with Embedded DC-DC Converter and Carrier-Based PWM Strategy for Wide Voltage Range Applications	2018
324	ITPW31	A Variable Switching Frequency Space Vector Modulation Technique for Zero Voltage Switching in Two Parallel Interleaved Three-Phase Inverters	2018
<b>MULTILEVEL INVERTER</b>			
325	ITPW32	Zero-/Low-Speed Operation of Multiphase Drive Systems with Modular Multilevel Converters.	2019
326	ITPW33	Dual-T-Type Seven-Level Boost Active-Neutral-Point-Clamped (DTT-7L-BANPC) Inverter	2019
327	ITPW34	Single-Phase Dual-Mode interleaved Multilevel Inverter (DMIMI) for PV Applications	2019
328	ITPW35	A Modulation Method for Leakage Current Reduction in a Three-Phase Grid-Tie Quasi-Z-Source Inverter	2018

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329	ITPW36	Photovoltaic AC Module Based on a Cuk Converter with a Switched-Inductor Structure	2018
330	ITPW37	Modelling a multilevel LCC resonant AC-DC converter for wide variations in the input and the load	2018
<b>DC TO DC CONVERSIONS</b>			
331	ITPW38	A New CCM/DCM Hybrid-Mode Synchronous Rectification Flyback Converter	2019
332	ITPW39	A ZVS Three-port DC/DC Converter for High- Voltage Bus Based Photovoltaic Systems	2019
333	ITPW40	A Novel Single-Input Dual-Output Three-Level DC-DC Converter	2018
334	ITPW41	Circulating Currents Suppression for IPOP Non-isolated DC/DC Converters Based on Modified Topologies.	2018
335	ITPW42	Design and analysis of a novel SEPIC-based multi-input DC/DC converter	2018
336	ITPW43	Principle and Topology Synthesis of Integrated Single-Input Dual-Output and Dual-Input Single-Output DC-DC Converters	2018
337	ITPW44	A Constant Frequency ZVS Control System for the Four-Switch Buck-Boost Dc-Dc Converter with Reduced Inductor Current	2018
338	ITPW45	Sepic Derived Hybrid Converter with Simultaneous AC and DC outputs.	2018

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<b>AC TO AC (CYCLOCONVERTER)</b>			
339	ITPW46	Performance Investigation of Three-Phase Three-Switch Direct PWM AC/AC Voltage Converters	2018
340	ITPW47	A single-phase ac to three-phase ac converter with a small link capacitor	2018
341	ITPW48	Novel Bipolar-Type Direct AC-AC Converter Topology Based on Non-Differential AC Choppers	2018
<b>AC&amp; DC DRIVES</b>			
342	ITPW49	Performance Enhancement of Evaporative Water Cooler Equipped with Permanent Magnet Brushless Motor Drive Based on Power Control Strategy	2019
343	ITPW50	Power Factor Correction of Three-Phase PWM AC Chopper Fed Induction Motor Drive System Using HBCC Technique	2019
344	ITPW51	A Simple Current-Constrained Controller for Permanent Magnet Synchronous Motor	2019
345	ITPW52	A Grid Interactive Permanent Magnet Synchronous Motor Driven Solar Water Pumping System	2018
346	ITPW53	Modified Dual Output Cuk Converter fed Switched Reluctance Motor Drive with Power Factor Correction	2018
347	ITPW54	Integrated Driving/Charging/Discharging Battery-Powered Four-Phase Switched Reluctance Motor Drive With Two Current Sensors	2018

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348	ITPW55	Standalone Photovoltaic Water Pumping System Using Induction Motor Drive with Reduced Sensors	2018
<b>ELECTRICAL VEHICLE APPLICATION</b>			
349	ITPW56	Power Factor Improvement in Modified Bridgeless Landsman Converter Fed EV Battery Charger	2019
350	ITPW57	Modular Tri-Port Converter for Switched Reluctance Motor based Hybrid Electrical Vehicles	2019
351	ITPW58	An Electrolytic Capacitor-less Bi-directional EV Charger for V2G and V2H Applications	2018
352	ITPW59	Design and Simulation of Front End Converter for Fuel Cell based Electric Vehicle Applications	2018
<b>FUZZY CONTROL TECHNIQUES</b>			
353	ITPW60	A Single Input Variable FLC for DFIG Based WPGS in Standalone Mode	2019
354	ITPW61	Hybrid Energy Management Strategy based on Fuzzy Logic and Optimal Control for Tri-actuated Powertrain System	2019
355	ITPW62	Development of Power Electronic Distribution Transformer Based on Adaptive PI Controller	2018
356	ITPW63	A Performance Investigation of a Four-Switch Three-Phase Inverter-Fed IM Drives at Low Speeds Using Fuzzy Logic and PI Controllers	2018

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<b>MICROGRID APPLICATION</b>			
357	ITPW64	Transfverter: imbuing transformer-like properties in an interlink converter for robust control of a hybrid ac-dc microgrid	2019
358	ITPW65	Highly-Efficient Bridgeless Dual-Mode Resonant Single Power-Conversion AC-DC Converter	2019
359	ITPW66	A Multilevel Distributed Hybrid Control Scheme for Islanded DC Microgrids	2019
360	ITPW67	Inverse Power Factor Droop Control for Decentralized Power Sharing in Series -Connected Micro Micro-Converters Based Islanding Microgrids	2018
<b>POWER SYSTEMS</b>			
361	ITPS01	A STATCOM Based on a Three-Phase, Triple Inverter Modular Topology for Multilevel Operation	2019
362	ITPS02	A Novel Low Voltage Ride Through Control Method for Current Source Grid-Connected Photovoltaic Inverters.	2019
363	ITPS03	A Three-Phase Single-Stage AC-DC Wireless-Power-Transfer Converter with Power Factor Correction and Bus Voltage Control	2019
367	ITPS04	A Wide-Input-Range High-Efficiency Step-down Power Factor Correction Converter Using Variable Frequency Multiplier Technique	2018
368	ITPS05	Design and Performance Analysis of Three-Phase Solar PV Integrated UPQC	2018

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369	ITPS06	PV-STATCOM: A New Smart Inverter for Voltage Control in Distribution Systems	2018
370	ITPS07	A General Decentralized Control Scheme For Medium /High Voltage Cascaded STATCOM	2018
371	ITPS08	Stability Analysis for the Grid-Connected Single-Phase Asymmetrical Cascaded Multilevel Inverter with SRF-PI Current Control under Weak Grid Conditions	2018
372	ITPS09	Control of Solar Photovoltaic Integrated Universal Active Filter Based on Discrete Adaptive Filter	2018
373	ITPS10	Replacing the Grid Interface Transformer in Wind Energy Conversion System With Solid- State Transformer	2018
374	ITPS11	Power Quality Improvement and Low Voltage Ride through Capability in Hybrid Wind-PV Farms Grid-Connected Using Dynamic Voltage Restorer	2018
375	ITPS12	An Improved Feed forward Control Method Considering PLL Dynamics to Improve Weak Grid Stability of Grid-Connected Inverters	2018
376	ITPS13	A Unified Control and Power Management Scheme for PV-Battery- Based Hybrid Micro grids for Both Grid-Connected and Islanded Modes	2018
377	ITPS14	Control Methods to Mitigate Voltage Sag Using Dynamic Voltage Restorer	2018
378	ITPS15	Single-Phase to Three-Phase Unified Power Quality Conditioner Applied in Single Wire Earth Return Electric Power Distribution Grids	2018

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VLSI			
ANALOG AMS (TANNER EDA)			
379	ITVL01	Delay Optimization of 4-Bit ALU Designed in FS-GDI Technique.	2019
380	ITVL02	Power-Delay-Product, Area and Threshold-Loss Analysis of CMOS Full Adder Circuits	2019
381	ITVL03	An Overview of Dynamic CMOS Comparators.	2019
382	ITVL04	Design of Swing Dependent XOR-XNOR Gates based Hybrid Full Adder	2019
383	ITVL05	Design Of Area Efficient And Low Power 4-Bit Multiplier Based On Full- swing GDI technique.	2019
384	ITVL06	Ultra Low Power Low Frequency On-Chip Oscillator for Elapsed Time Counter	2019
385	ITVL07	High speed and low power preset-able modified TSPC D flip-flop design and performance comparison with TSPC D flip-flop	2018
386	ITVL08	Low Power 4×4 Bit Multiplier Design using Dadda Algorithm and Optimized Full Adder.	2018
387	ITVL09	A High Performance Gated Voltage Level Translator with Integrated Multiplexer	2018
388	ITVL10	Low-Power and Fast Full Adder by Exploring New XOR and XNOR Gates.	2018



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<b>DIGITAL SIGNAL PROCESSING</b>			
389	ITVL11	A Deterministic Low-Complexity Approximate (Multiplier-Less) Technique for DCT Computation.	2019
390	ITVL12	Design and VLSI Implementation of CSD based DA Architecture for 5/3 DWT.	2019
391	ITVL13	Parallel Implementation of Reinforcement Learning Q-Learning Technique for FPGA	2019
392	ITVL14	High-Throughput Multifilter Interpolation Architecture for AV1 Motion Compensation	2019
393	ITVL15	Double Error Correcting Codes for High Density Memory Systems	2019
394	ITVL16	Realizing Boolean functions using Probabilistic Spin Logic	2019
395	ITVL17	FPGA Implementation of ARM Processor	2018
396	ITVL18	ECG Signal De-noising based on Wavelet Transform using Xilinx System Generator.	2018
397	ITVL19	Area and Power Efficient VLSI Architecture of Distributed Arithmetic Based LMS Adaptive Filter.	2018
398	ITVL20	An Efficient VLSI Architecture for Convolution Based DWT Using MAC.	2018
399	ITVL21	FIR Filter Design Based on FPGA	2018



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<b>FPGA AND DIGITAL DESIGN</b>			
400	ITVL22	Performance Analysis of Wallace Tree Multiplier with Kogge Stone Adder using 15-4 Compressor.	2019
401	ITVL23	Implementation of an XOR Based 16-bit Carry Select Adder for Area, Delay and Power Minimization.	2019
402	ITVL24	VLSI Architectures for 8 Bit Data Comparators for Rank Ordering Image Applications.	2019
403	ITVL25	Modified Binary Multiplier Circuit Based on Vedic Mathematics	2019
404	ITVL26	Optimized FPGA Implementation of the CRC Using Parallel Pipelining Architecture	2019
405	ITVL27	An Efficient Design of 16 Bit MAC Unit using Vedic Mathematics	2019
406	ITVL28	Linear Approximation and Differential Attacks on Logic Locking Techniques	2019
407	ITVL29	Low Complexity & Improved Efficiency of Encoded Data Using Peres Gate in BWAR with Testable Feature	2019
408	ITVL30	Test Pattern Generation using NLFSR for Detecting Single Stuck-at Faults	2019
409	ITVL31	Design and Analysis of Area and Power Efficient Approximate Booth Multipliers	2019
410	ITVL32	Design and Implementation of DES Based on AES Algorithm in IOT Environment	2019

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411	ITVL33	Low-Power High-Accuracy Approximate Multiplier Using Approximate High-Order Compressors	2019
412	ITVL34	Parameterizable FPGA Implementation of SHA-256 using Block chain Concept	2019
413	ITVL35	High Performance Division Circuit using Reversible Logic Gates	2018
414	ITVL36	Fast HUB Floating-Point Adder for FPGA.	2018
415	ITVL37	Novel High speed Vedic Multiplier proposal incorporating Adder based on Quaternary Signed Digit number system.	2018
416	ITVL38	FPGA Implementation of an Improved Watchdog Timer for Safety-critical Applications.	2018
417	ITVL39	Chip Design for Turbo Encoder Module for In-Vehicle System.	2018
418	ITVL40	Efficient Modular Adders based on Reversible Circuits.	2018
419	ITVL41	MAES: Modified Advanced Encryption Standard for Resource Constraint Environments.	2018
<b>QCA TECHNOLOGY</b>			
420	ITVL42	Comparative Analysis of Full Adder Custom Design Circuit using Two Regular Structures in Quantum-Dot Cellular Automata (QCA)	2019
421	ITVL43	Design and Implementation of 4:1 Multiplexer for Reversible ALU using QCA	2018

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422	ITVL44	A Novel Design of Flip-Flop Circuits using Quantum Dot Cellular Automata (QCA).	2018
423	ITVL45	Binary To Gray Code Converter Implementation Using QCA	2018