Arun A. Balakrishnan

ASSISTANT PROFESSOR
Department of Electronics
Cochin University of Science and Technology

Curriculum Vitae

Experience

UG Level	1	years
PG Level	8	years

Projects Done

UG	2
PG	2
Co PI	3

Professional Training

Online Courses	31
Seminars/Workshops	23
FDPs	12
STTPs	14

Conferences

Attended	14
Organised	10

Project Guidance

UG	3
PG	27

Achievements

Best Paper Award	1
Rank	2
Gate Score	3

Publications

National Conference	1
International Conference	20
International Journal	3

Teaching · Projects Done · Training Experience · Conferences · Projects Guided · Achievements · Publications

Curriculum Vitae of Arun A. Balakrishnan

1. *Name:*   Arun A. Balakrishnan

2. *Address:*   Assistant Professor, Department of Electronics,

Cochin University of Science & Technology

Kochi - 682 022, Kerala, India.

3. *Date of Birth:*   31 - 01 - 1988

4. *Academic Qualifications:*

Course	Board or University	Year of Passing	Specialisation	% or CGPA	Class or Rank
Xth	SSLC	2003	-	92.83	Distinction
XIIth	HSE	2005	Computer Science	95	Distinction
B. Tech.	Calicut University	2009	Electronics & Communication	81.46	Fourth
M. Tech.	Kerala University	2011	Signal Processing	9.53	First

5. *Professional Experience:*

Designation	Institution	Period
Guest Lecturer	College of Engineering, Trivandrum	01/06/2010 - 31/05/2011
Assistant Professor	PRS College of Engineering & Technology, Trivandrum	03/08/2011 - 27/01/2012
Assistant Professor	Rajagiri School of Engineering & Technology, Cochin	31/01/2012 - 30/07/2015
Assistant Professor	Cochin University of Science & Technology, Cochin	31/07/2015 - Till date

6. Organisational Positions Held:

* AEI NBA Coordinator, Rajagiri School of Engineering & Technology, Cochin

* IQAC Committee member, Rajagiri School of Engineering & Technology, Cochin

* IQAC Sub Committee member, Cochin University of Science & Technology, Cochin

* M. Tech. Syllabus Revision Committee member, M. G. University & Kerala Technological University (KTU)

* M. Sc. Syllabus Revision Committee member, Cochin University of Science & Technology, Cochin

* Member, Passing Board (M. Tech. & M. Sc.), Department of Electronics, Cochin University of Science & Technology, Cochin

* Member, Anti Ragging Committee, Department of Electronics, Cochin University of Science & Technology, Cochin

7. Scholarships:

* GATE Scholarship for a period of two years (2009 - 2011) during M. Tech

8. Fields of Research & Teaching:

* Digital Signal & Image Processing Using MATLAB & Python

* Signals & Systems Using MATLAB & Python

* Solid State Devices & VLSI

* Machine Learning Using Python

9. Projects Done/Undertaken:

Sl. No.	Title	Details
1	16 bit RISC Processor in VHDL	CET, Trivandrum (6 months)
2	Analog FFT Using Current Mirrors	CET, Trivandrum (1 year)
3	TMS320 based Medical Image Processing System	Co-PI, Rajagiri Engineering College, Kochi - 3 Lakhs (5 year)
4	Algorithms for Underwater Image Enhancement, Object Detection & Cable Tracking	Co-PI, Naval Research Board, New Delhi - 30.6 Lakhs (2 year)
5	Machine Learning Models for Underwater Image Enhancement and Content Analysis	Co-PI, Naval Research Board, New Delhi - 48.79 Lakhs (2 year)

10. Professional Training Experience:

Sl. No.	Title	Institution	Duration
1	Seminar on "Advanced Networking"	RSET	5th March 2012
2	FDP on "Modern trends in Industrial Automation"	RSET	23rd to 27th April 2012
3	International Workshop on "Recent trends in Engineering & Technology"	RSET	31st October 2012
4	"LABVIEW training programme"	Trident Tech.	5th to 7th November 2012
5	FDP on "Applications of Mathematics"	RSET	3rd to 15th December 2012
6	State level Electronics System Design & Manufacturing (ESDM) workshop	Kerala Govt.	30th April 2013
7	STTP on "Research Frontiers in Networking, Clustering & Cloud computing"	RSET	3rd May to 10th May 2013
8	FDP on "Industrial Pollution Control"	RSET	25th to 29th Nov. 2013
9	FDP on "Enhanced Teaching Methods Using Moodle"	RSET	10th, 16th December 2013
10	FDP on "Honeywell Experion DCS"	RSET	23rd to 26th April 2014
11	International Workshop on "Solar Energy Applications"	RSET	29th October 2014
12	Seminar on "Recent Trends in Cloud Computing "	RSET	5th December 2014
13	Training on "C6748 OMAP LCDK DSP Kit"	Starcom	26th, 27th February 2015
14	Training on "Speech/ Image/ ECG Databases"	RSET	13th March 2015
15	Coordinator of Training Programme on "Keysight ADS & EMPro "	DoE, CUSAT	28th to 30th October 2015

Sl. No.	Title	Institution	Duration
16	Resource person of one day workshop on "Technical Documentation Using Latex & Beamer"	DCA, CUSAT	3rd Dec. 2015
17	Coordinator of IEEE APS Workshop on "Computational Electromagnetics"	DoE, CUSAT	7th to 9th December 2015
18	Workshop on "Facilitating Innovation and Patent Filing"	CUSAT	16th Dec. 2015
19	One Day International Workshop on "Dynamic Analysis of Programs"	SoE, CUSAT	13th Jan. 2016
20	Two Day "Induction programme for newly recruited teachers"	CUSAT	15th to 16th February 2016
21	Coordinator of KSCSTE sponsored Workshop on "Advances in Technologies for Sustainable Development"	DoE, CUSAT	11th May 2016
22	One Day "FLAIR Orientation Programme"	Kerala Govt.	1st Sept. 2016
23	Short Term Training Programme on "Scratch to End Product (STEP)"	SoE, CUSAT	26th to 30th Sept. 2016
24	Three Day "FLAIR Induction Training Programme"	Kerala Govt.	6th to 8th October 2016
25	User Scientist Workshop on "Applications of Stratosphere Troposphere Wind Profiler Radar"	CUSAT	9th to 10th February 2017
26	"FLAIR National Internship in Marine Sensor Systems Group"	NIOT	22nd May to 16th June 2017
27	Two Day Nvidia CUDA Workshop on "GPU Programming"	DCS, CUSAT	25th to 26th Sept. 2017
28	One Day Nvidia DLI Workshop on "Image Classification and Object Detection Using DIGITS"	DoE, CUSAT	12th October 2017
29	Coordinator of One Day Workshop on "Basics of CUDA Programming"	DoE, CUSAT	13th October 2017

Sl. No.	Title	Institution	Duration
30	Participated in "Embedded System Design Contest"	TI, India	31st October 2017
31	One Day "NI Engineering Education & Research Seminar"	NI, India	6th Nov. 2017
32	Coordinator of Two day IEEE APS Workshop on "Software Defined Radio"	DoE, CUSAT	20th to 21st Nov. 2017
33	Two Day Workshop on "Course Authoring Programme"	IIT Bombay	23rd to 24th Nov. 2017
34	Coordinator of One day Workshop on "Deep Learning - A Deep Dive: From Basics to Advanced"	DoE, CUSAT	8th December 2017
35	Faculty Coordinator of DoE, CUSAT for "Sasthrayaan"	CUSAT	27th to 28th Feb. 2017
36	Coordinator of Two-Week Faculty Development Programme on "Foundation Program in ICT for Education"	IITB	24th to 25th March 2018
37	Resource Person in Short Term Training Programme on "Introduction to FOSS and Engineering Tools"	MACE	19th April 2018
38	One Day "NSS Programme Officers Meeting"	NSS, CUSAT	3rd May 2018
39	FDP on "Rapid prototyping of Embedded Systems through Code Generation"	DoE, CUSAT	7th to 11th May 2018
40	Coordinator of Two-Week Faculty Development Programme on "Pedagogy for online and Blended Teaching-Learning Process"	IITB	12th to 13th May and 26th to 27th May 2018

41	Three day Residential Workshop on "Machine Learning"	DCA, CUSAT	22nd to 24th June 2018
42	Faculty Development Programme on "Signal Processing - From Fundamentals to Challenges"	RSET	9th to 13th July 2018
43	Workshop on "Embedded Programming - ARM architecture"	DoE, CUSAT	24th October 2018
44	AICTE Workshop on "Examination Reforms"	AICTE	7th December 2018
45	Coordinator of Workshop on "Machine Learning"	DoE, CUSAT	13th to 15th December 2018
46	FDP on "Deep Learning"	DCS, CUSAT	3rd to 4th January 2019
47	Coordinators Workshop on "Python"	IITB	25th May 2019
48	Coordinator of Workshop "Python"	DCS, CUSAT	22nd June 2019
49	NPTEL MOOC Course on "Deep Learning"	IIT, Madras	01st July to 31st October 2019
50	"Orientation Programme"	ASC, UoC	06th to 25th January 2020
51	FDP in "Data Science Using R and Geo Gebra"	JM College, Trichi	11th to 14th May 2020

11. *Conferences & Workshops Attended:*

* "**10th National Conference on Technological Trends (NCTT 2009)**" held at College of Engineering, Trivandrum during 6th and 7th November 2009.

* "**12th National Conference on Technological Trends (NCTT 2011)**" held at College of Engineering, Trivandrum during 19th and 20th August 2011.

* "**IEEE International Conference on Circuit, Power & Computing Technologies (ICCPCT 2013)**" held at Noorul Islam University, Kumaracoil during 21st and 22nd March 2013.

* "**IEEE Third International Conference on Advances in Computing and Communications (ICACC 2013)**" held at Rajagiri School of Engineering & Technology, Kochi during 29th to 31st August 2013.

* "**International Conference and Workshop on Fractals & Wavelets (ICFW 2013)**" held at Rajagiri School of Engineering & Technology, Kochi during 9th to 16th November 2013.

* "**International Conference on Advanced Computing & Communication Systems (ICACCS 2013)**" held at Sri Eshwar College of Engineering, Coimbatore during 19th to 21st December 2013.

* "**79th Annual Conference of Indian Mathematical Society**" held at Rajagiri School of Engineering & Technology, Kochi during 28th to 31st December 2013.

* "**Fourth International Conference on Advances in Computing and Communications (ICACC 2014)**" held at Rajagiri School of Engineering & Technology, Kochi during 27th to 29th August 2014.

* "**Thirteenth Biennial Symposium on Ocean Electronics (SYMPOL 2015)**" held at Cochin University of Science & Technology, Kochi during 18th to 20th November 2015.

* "**Fifteenth Biennial Symposium on Antennas & Propagation (APSYM 2016)**" held at Cochin University of Science & Technology, Kochi during 15th to 17th December 2016.

* "**Fourteenth Biennial Symposium on Ocean Technology (SYMPOL 2017)**" held at Cochin University of Science & Technology, Kochi during 6th to 8th December 2017.

* "**Sixteenth Biennial Symposium on Antennas & Propagation (APSYM 2018)**" held at Cochin University of Science & Technology, Kochi during 03rd to 05th December 2018.

* "**Eighth International Symposium on Embedded Computing & System Design (ISED 2018)**" held at Cochin University of Science & Technology, Kochi during 13th to 15th December 2018.

* "**Fifteenth Biennial Symposium on Ocean Technology (SYMPOL 2019)**" held at Cochin University of Science & Technology, Kochi during 11th to 13th December 2019.

12. *Conferences & Symposiums Organised:*

* Member of Executive Committee, "**IEEE INDICON**" held at Rajagiri School of Engineering & Technology, Kochi during 7th to 9th December 2012.

* Member of Core Organising Committee, "**Third International Conference on Advances in Computing and Communications (ICACC 2013)**" held at Rajagiri School of Engineering & Technology, Kochi during 29th to 31st August 2013.

* Member of Core Organising Committee, "**Fourth International Conference on Advances in Computing and Communications (ICACC 2014)**" held at Rajagiri School of Engineering & Technology, Kochi during 27th to 29th August 2014.

* Member of Core Organising Committee, "**Fifth International Conference on Advances in Computing and Communications (ICACC 2015)**" held at Rajagiri School of Engineering & Technology, Kochi during 3rd to 4th September 2015.

* Member of Core Organising Committee, "**Thirteenth Biennial Symposium on Ocean Electronics (SYMPOL 2015)**" held at Cochin University of Science & Technology, Kochi during 18th to 20th November 2015.

* Member of Core Organising Committee, "**Fifteenth Biennial Symposium on Antennas & Propagation (APSYM 2016)**" held at Cochin University of Science & Technology, Kochi during 15th to 17th December 2016.

* Member of Core Organising Committee, "**Fourteenth Biennial Symposium on Ocean Technology (SYMPOL 2017)**" held at Cochin University of Science & Technology, Kochi during 6th to 8th December 2017.

* Member of Core Organising Committee, "**Fifteenth Biennial Symposium on Antennas & Propagation (APSYM 2018)**" held at Cochin University of Science & Technology, Kochi during 03rd to 05th December 2018.

* Member of Core Organising Committee, "**Eighth International Symposium on Embedded Computing & System Design (ISED 2018)**" held at Cochin University of Science & Technology, Kochi during 13th to 15th December 2018.

* Member of Core Organising Committee, "**Fifteenth Biennial Symposium on Ocean Technology (SYMPOL 2019)**" held at Cochin University of Science & Technology, Kochi during 11th to 13th December 2019.

13. *Projects Guided:*

Sl. No.	Title	Level	Period
1	A novel approach to detect and localize texts in natural scene images	PG	2012
2	A comparitive study of denoised MRI images using contourlet transform,wavelet transform & block DCT	PG	2012
3	Reconstruction of beat signal in radar altimeter	PG	2012
4	Application of compressive sampling in sparse channel estimation of OFDM	PG	2012
5	Tool identification by feature extraction & pattern recognition	UG	2013
6	Comparison of histogram based image enhancement techniques and its applications in medical images	PG	2013
7	Contrast enhancement based denoising method in DTI	PG	2013
8	Extreme learning machine for sparse signal recovery	PG	2013

Sl. No.	Title	Level	Period
9	Comparison of image segmentation algorithms and their applications in medical imaging	UG	2014
10	Glaucoma detection using optic disc and optic cup segmentation from digital retinal fundus images	PG	2014
11	Driver Drowsiness detection using physiological and image processing method	PG	2014
12	Diagnosing of the lung status using respiratory signal derived from PPG	PG	2014
13	Comparative study of image inpainting techniques	UG	2015
14	A real world application of dermascopic image segmentation using wavelet networks	PG	2015
15	Comparison of enhanced medical images using Bayesian asymmetric model	PG	2015
16	Prostate segmentation in MR images using discriminant boundary features	PG	2015
17	Using Advanced Formal Techniques for Model Based Embedded Engineering	PG	2016
18	Analysis, Re-synthesis & Denoising of Spectrogram	PG	2017
19	Character & Voice Recognition Using Neural Network	PG	2017
20	Underwater Image Enhancement Using CLAHE and Wavelength Compensation	PG	2018
21	Adaptive Over Segmentation based Underwater Object Detection Using OpenCV	PG	2018
22	Design and Fabrication of Matching Circuit for Hydrophone Array	PG	2018
23	Simulation of Hydrophone Array Configuration for Wideband Beamforming	PG	2018
24	Density Based Traffic Control System Using Image Processing	PG	2018
25	OFDM Implementation Using GNU Radio & USRP	PG	2019

Sl. No.	Title	Level	Period
26	Comparative Study of Underwater Object Detection Using Conventional Machine Learning Methods & Transfer Learning Techniques	PG	2019
27	Optimum Wideband Beamforming Techniques for Sensor Arrays in Frequency Domain	PG	2019
28	Underwater Object Detection Using Machine Learning	PG	2019
29	Speaker Recognition Using Machine Learning	PG	2020
30	Underwater Image Enhancement Using CLAHE & USM	PG	2020

14. Awards & Achievements:

* Won Best Paper Award for the paper "**Analog CMOS Implementation of Fast Fourier Transform Using Current Mirror Circuits**" in **12th National Conference on Technological Trends (NCTT 2011)** held at College of Engineering, Trivandrum during 19th and 20th August 2011.

* **1st rank** in Kerala University for M.Tech Signal Processing with highest **CGPA 9.53**

* **4th rank** in Calicut University for B.Tech Electronics & Communication Engineering

* Qualified GATE in 2009, 2014, 2015 with maximum score as 542

15. Online Courses with E-Certificates:

1. Structuring Machine Learning Projects - deeplearning.ai

2. Improving Deep Neural Networks : Hyperparameter Tuning, Regularization and Optimization - deeplearning.ai

3. Mathematics for Machine Learning:PCA - Imperial College, London

4. Mathematics for Machine Learning:Linear Algebra - Imperial College, London

5. Neural Networks and Deep Learning - deeplearning.ai

6. Mathematics for Machine Learning: Multivariate Calculus - Imperial College, London

7. Convolutional Neural Networks - deeplearning.ai

8. Sequence Models - deeplearning.ai

9. Introduction to Tensorflow for Artificial intelligence, Machine learning and Deep Learning - deeplearning.ai

10. Convolutional Neural Networks in Tensorflow - deeplearning.ai

11. Natural Language Processing in Tensorflow - deeplearning.ai

12. Sequences, Time Series and Prediction - deeplearning.ai

13. Introduction to Tensorflow - Google Cloud

14. Python Basics - University of Michigan

15. Python Function, Files and Dictionaries - University of Michigan

16. Python Classes and Inheritance - University of Michigan

17. Create your first Python program - Coursera Project Network

18. Computer Vision - Image Basics with OpenCV and Python - Coursera Project Network

19. Linear Regression with numpy and Python - Coursera Project Network

20. Predicting Housing Prices with Regression Using Tensorflow - Coursera Project Network

21. Basic Image Classification with Tensorflow - Coursera Project Network

22. Image Data Augmentation with Keras - Coursera Project Network

23. Perform Sentiment Analysis using scikit-learn - Coursera Project Network

24. Support Vector Machines with scikit-learn - Coursera Project Network

25. Facial Expression Recognition with Keras - Coursera Project Network

26. Multiple Linear Regression with scikit-learn - Coursera Project Network

27. Image Super Resolution using Autoencoders in Keras - Coursera Project Network

28. Perform Real Time Object Detection with YOLOv3 - Coursera Project Network

29. Traffic sign Classification Using Deep Learning in Python/Keras - Coursera Project Network

30. Image Denoising Using Auto encoders in Keras and Python - Coursera Project Network

31. Foundational Artificial Intelligence - SkillUp Online (NASSCOM)

16. Publications:

1. **Arun A. Balakrishnan**, V. Suresh Babu, M. R. Baiju, "Analog CMOS Implementation of Fast Fourier Transform Using Current Mirror Circuits" ***National Conference on Technological Trends (NCTT) 2011*** held at College of Engineering, Trivandrum on 19/08/2011.

2. **Arun A. Balakrishnan**, V. Suresh Babu, M. R. Baiju, "Implementation of radix-2 and split-radix Fast Fourier Transform Algorithm Using Current Mirrors, "*International Conference on Circuits, Power and Computing Technologies (ICCPCT 2013)*, DOI:10.1109/ICCPCT.2013.6528883, Mar. 2013, pp. 730 – 735.

3. Ajith V. Pillai, **Arun A. Balakrishnan**, Rina Anna Simon, Renoh C. Johnson Padmagireesan S. J., "Detection and Localization of Texts from Natural Scene Images Using Scale Space and Morphological Operations,"*International Conference on Circuits, Power and Computing Technologies (ICCPCT 2013)*, DOI: 10.1109/ICCPCT.2013.6528865, Mar. 2013, pp. 880 – 885.

4. Prasanth K., Baby Paul, **Arun A. Balakrishnan**, "Fetal ECG Extraction Using Adaptive Filters,"*International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering*, Vol. 2, Issue 4, April 2013.

5. Adithya Job, Anooj Rohit, B. Suryanarayanan, Prasanth Joseph Panangadan, **Arun A. Balakrishnan**, "An Efficient Tool Identification System Using Principal Component Analysis,"*International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering*, Vol. 2, Issue 6, June 2013.

6. Vijitha Rajan, **Arun A. Balakrishnan**, Nissar K. E., "OFDM Channel Estimation Using Compressed sensing l_1 regularized least square problem solver"*IEEE Third International Conference on Advances in Computing and Communications (ICACC 2013)*, DOI: 10.1109/ICACC.2013.24, Aug. 2013, pp. 94 – 97.

7. Geomol George, **Arun A. Balakrishnan**, Apren T. J., "Reconstruction of Beat Signal in Radar Altimeter Using Signal Processing"*IEEE Third International Conference on Advances in Computing and Communications (ICACC 2013)*, DOI: 10.1109/ICACC.2013.38, Aug. 2013, pp. 161 – 164.

8. Padmagireesan S. J., Renoh C. Johnson, **Arun A. Balakrishnan**, Veena Paul, Abdul Raheem A, Ajith V. Pillai, "Performance Analysis of Magnetic Resonance Image Denoising Using Contourlet Transform,"*IEEE Third International Conference on Advances in Computing and Communications (ICACC 2013)*, DOI: 10.1109/ICACC.2013.84, Aug. 2013, pp. 396 – 399.

9. Solwin Johnson, **Arun A. Balakrishnan**, "Contrast Enhancement Based Denoising Method in Diffusion Tensor Imaging,"*IEEE INDICON 2013, IIT Bombay*, DOI: 10.1109/INDCON.2013.6726089, Dec. 2013, pp. 1 – 4.

10. Solwin Johnson, **Arun A. Balakrishnan**, "Comparison of Denoising Methods in Diffusion Tensor Imaging,"*IEEE INDICON 2013, IIT Bombay*, Dec. 2013, pp. 1 – 4.

11. Vijeesh Govind, **Arun A. Balakrishnan**, Dominic Mathew, "A Novel Approach for Contrast Enhancement and Noise Removal of Medical Images,"*2013 International Conference on Control, Communication and Computing (ICCC 2013)*, College of Engineering, Trivandrum, Dec. 2013, pp. 153 – 156.

12. Vijeesh Govind, **Arun A. Balakrishnan** "Medical Image Enhancement by Applying Averaging Method in Clusters," *International Conference on Advanced Computing & Communication Systems (ICACCS 2013)*, Sri Eshwar College of Engineering, Coimbatore, 19 – 21 December 2013.

13. Deepu Kurian, Johnson Joseph, Krishnaja Radhakrishnan, **Arun A. Balakrishnan**, "Drowsiness detection using Photoplethysmography Signal," accepted in **IEEE Fourth International Conference on Advances in Computing and Communications (ICACC 2014)**, 27–29 August 2014.

14. Asha Merin Jose, **Arun A. Balakrishnan**, "A Novel Method for Glaucoma Detection Using Optic Disc and Cup Segmentation in Digital Retinal Fundus Images," in **The International Conference on Circuit, Power and Computing Technologies (ICCPCT 2015)**, Mar. 2015.

15. Lijo Baby Jacob, **Arun A. Balakrishnan**, "Dermascopic Image Segmentation Using Multi mother Wavelet Networks," in **International Conference on Emerging Trends in Engineering & Technology (ICET 2015)**, Aug. 2015, pp. 48 – 52.

16. Uthara E. Prakash, Athira Thankappan. Vishnupriya K. T., **Arun A. Balakrishnan**, "Density Based Traffic Control System Using Image Processing," in **International Conference on Emerging Trends and Innovations in Engineering & Technological Research (ICETIETR2k18)**, July. 2018, pp. 1 – 4.

17. Rashida K., Thulasi Devi P.G., **Arun A. Balakrishnan**, Supriya M. H. "High Resolution Wideband Acoustic Beamforming and Underwater Target Localization using 64-Element Linear Hydrophone Array," in **2018 8th International Symposium on Embedded Computing and System Design (ISED)**, Dec. 2018, pp. 158 – 161.

18. Minu A. Pillai, Alwyn Ghosh, Jestin Joy, Suraj Kamal, Satheesh Chandran C., **Arun A. Balakrishnan**, Supriya M. H. "Acoustic Source Localization using Random Forest Regressor," in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 191 – 199.

19. Dhanya P. R., Syamily Anilkumar, **Arun A. Balakrishnan**, Supriya M. H. "L-CLAHE Intensification Filter (L-CIF) Algorithm for Underwater Image Enhancement and Colour Restoration," in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 117 – 128.

20. Sanila K. H., **Arun A. Balakrishnan**, Supriya M. H. "Underwater Image Enhancement Using White Balance, USM and CLHE," in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 106 – 116.

21. Syamily Anilkumar, Dhanya P. R., **Arun A. Balakrishnan**, Supriya M. H. "Algorithm for Underwater Cable Tracking Using CLAHE based Enhancement," in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 129 – 137.

22. Sravya N., **Arun A. Balakrishnan**, Supriya M. H. "An Efficient Underwater Pipeline Detection System Using Machine Learning Approach," in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 181 – 190.

23. Rashida K., Suraj Kamal, Satheesh Chandran C., **Arun A. Balakrishnan**, Supriya M. H. "Prototype Implementation of Spatial Filtering using Sensor Array,"in **2019 International Symposium on Ocean Technology (SYMPOL 2019)**, Dec. 2019, pp. 39 – 46.

24. Remya A. R., **Arun A. Balakrishnan**, Suraj Kamal, Satheesh Chandran C., Supriya M. H. "Modular Microservice based GPU Utilization Manager with Gunicorn,"**Journal of Science and Technology**, Vol. 5, No. 4, pp. 230 – 237, July 2020

Curriculum Vitae

Arun A. Balakrishnan