

Profile

Name: Dr. Aparna P
Designation: Assistant Professor, E&C Dept, National Institute Of Technology Karnataka,
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Academic records:

(A) **Ph.D.:** From NITK, Surathkal in March 2012 in the **Area of:** Multimedia Signal Processing.
under the guidance of Prof. Sumam David, EC Dept, NITK, Surathkal

(B) **Post Graduate: M.Tech** (Digital Electronics and Advanced Communication) - NITK, Surathkal, in July 2004.

(C) **Graduate: B.E.(E&C) from** N.M.A.M. Institute of Technology, Nitte, Mangalore University in 1999.

Teaching Experience:

1. Worked as Lecturer in Canara First Grade College, Mangalore for One year (1999- 2000).
2. Worked as Assistant Lecturer in NITK, Surathkal for four semesters.
3. Joined E&C Dept, NITK, Surathkal in 2008 Feb as Assistant Professor.

Courses Handled:

1. Microprocessor (ARM7)
2. Embedded System
3. Advanced Computer Architecture
4. Data Structures
5. Digital Signal Compression
6. Linear Systems and Circuits
7. Advanced DSP
8. Digital Electronics and Computer Architecture
9. Digital Design with FPGA
10. Audio and speech processing

Ph.D. Guided:

Completed-2, Submitted-1, Ongoing-4

Projects Guided recently:

- Complexity reduction of Intracoding in HEVC.
- Implementation of Distributed Video Coding on Stretch Processor.
- Hyper-spectral Data compression using distributed source coding principles.
- Implementation of wavelet lifting scheme on FPGA.
- Implementation of Video Processing Algorithms on Virtex-2 and MicroBlaze.
- Biomedical signal processing
- Implementation of video watermarking algorithm on virtex-4 FPGA
- Implementation of VLIW processor.
- Architectures for signal processing

List of Papers Published in Journals:

1. B. K. Chandrika, P. Aparna & S. Sumam David (2020) An Approach for Diagnostically Lossless Coding of Volumetric Medical Data Based on Wavelet and Just-Noticeable-Distortion Model, IETE Journal of Research, DOI: 10.1080/03772063.2020.1844070 (SCIE)
2. Lakshmi Poola & P. Aparna (2020) A Mixed Parallel and Pipelined Efficient Architecture for Intra Prediction Scheme in HEVC, IETE Technical Review, 11 Nov 2020. (SCIE) DOI: 10.1080/02564602.2020.1841686
3. B. Sushma, P. Aparna, "Distributed video coding based on classification of frequency bands with block texture conditioned key frame encoder for wireless capsule endoscopy", Biomedical Signal Processing and Control, Volume 60, July 2020, 101940, DOI:10.1016/j.bspc.2020.101940, (SCIE indexed)
4. S. Shilpa Kamath, P. Aparna and Abhilash Anthony (2020), "Performance enhancement of HEVC lossless mode using context-based angular and planar intra predictions", Multimedia Tools and Applications, Springer, pp. 1–23. DOI: 10.1007/s11042-019-08466-4, (SCIE indexed)
5. S. Shilpa Kamath, P. Aparna and Abhilash Anthony (2020), "Pixelwise improvised blend of predictors in HEVC lossless mode", International Journal of Electronics and Communications (AEU"), Elsevier, Vol. 114, DOI: 10.1016/j.aeue.2019.153000, (SCIE indexed)
6. Srinidhi, C. L., Aparna, P., & Rajan, J. , " Automated Method for Retinal Artery/Vein Separation via Graph Search Metaheuristic Approach", IEEE Transactions on Image Processing., doi: 10.1109/TIP.2018.2889534, vol 28, pp 2705-2718 (SCI)
7. S. Shilpa Kamath, P. Aparna, Abhilash Antony, "Gradient-oriented directional predictor for HEVC planar and angular intra prediction modes to enhance lossless compression", AEU - International Journal of Electronics and Communications, Elsevier Publishers, Vol 95, October 2018, Pages 73-81, <https://doi.org/10.1016/j.aeue.2018.07.037>. (SCI & SCIE Indexed)
8. L Srinidhi, C., Aparna, P. & Rajan,J , "A visual attention guided unsupervised feature learning for robust vessel delineation in retinal images", Journal Of Biomedical Signal Processing and Control, Elsevier Publishers, Vol 44, July 2018, Pages 110-126b, <https://doi.org/10.1016/j.bspc.2018.04.016> (SCIE Indexed)
9. L Srinidhi, C., Aparna, P. & Rajan,J, "Recent Advancements in Retinal Vessel Segmentation", Journal of Medical Systems, Springer, April 2017, 2017,41:70, doi:10.1007/s10916-017-0719-2. (SCIE indexed).
10. Chandrika B.K., Aparna P., Sumam David S., " Perceptually Lossless Coder for Volumetric Medical Image Data", Journal of Visual Communication and Image Representation, Elsevier Publishers, Vol 46, July 2017,pp 23-32, doi.org/10.1016/j.jvcir.2017.03.006, (SCIE Indexed)
11. Chandrika B.K., Aparna P., Sumam David S., "Visually Lossless Coder for Volumetric MRI and CT Image Data using Wavelet Transform", International Journal of Computational Vision and Robotics, Vol. 7, No. 6, 2017, Inderscience Publishers. (Scopus Indexed)

12. D. Sai Parameshwari, Aparna P. "An efficient framework for segmentation and identification of tumours in brain MR images", *Int. J. Advanced Media and Communication*, Vol. 6, Nos. 2/3/4, 2016. (Scopus Indexed)
13. Chandrika B.K., Aparna P., Sumam David S., Analysis and Comparison of Symmetry based Lossless and Perceptually Lossless Algorithms for Volumetric Compression of Medical Images, *Journal of Medical Informatics and Technologies*, Vol. 24, pp. 147-154, 2015.
14. Aparna P. and Sumam David, "Low Complexity Distributed Video Coding with Golay Codes," *International Journal of Machine Learning and Computing* vol. 2, no. 4, pp. 466-470, 2012.
15. Aparna, P. and David, S. (2011) 'Efficient Distributed Video Coding based on principle of syndrome coding', *International Journal of Signal and Imaging Systems Engineering* 2011 - Vol. 4, No.4 pp. 212 - 219, DOI: 10.1504/IJSISE.2011.044533.(Scopus indexed)
16. Aparna P, Sivaprakash Reddy, Sumam David, "Distributed video coding using LDPC codes for wireless video", *Journal on Wireless Sensor Networks*, Scientific Research Publishing, Inc. USA, 2009, 1, 334-339

List of Papers Published in Conferences:

1. Lakshmi, Aparna P, "Efficient architectures for planar and DC modes of intra prediction in HEVC", 7th International Conference on Signal Processing and Integrated Networks, SPIN 2020 (2020), 27-28 Feb 2020, Amity University, Delhi.
2. S. Shastri, Lakshmi and P. Aparna, "Complexity Analysis of Hardware Architectures for Intra Prediction unit of High Efficiency Video Coding (HEVC)," 2020 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bangalore, India, 2020, pp. 1-6, doi: 10.1109/CONECCT50063.2020.9198553.
3. Sushma B and Aparna P, "Texture Classification based Efficient Image Compression Algorithm for Wireless Capsule Endoscopy", 5th Intl. Conference ICCED 2019 April 11th to 13th 2019, at Singapore
4. Garivi, Haritha., Aparna P, Pathipati Srihari, and Gnane Swarnadh Satapathi, "Analysis of real-time tracking_filters implementation in FPGA. In 2018 IEEE Distributed Computing", VLSI, Electrical Circuits and Robotics (DISCOVER) . IEEE, 13-14 August 2018.
5. Shilpa Kamath, Aparna P., Abhilash Antony, "Sample-based DC Prediction Strategy for HEVC Lossless Intra Prediction Mode", 2017 Fourth IEEE ICIIP, 21st-23rd December 2017, Jaypee University of Information Technology, Shimla, Himachal Pradesh, INDIA
6. Seema K., Aparna P., "A Feasible QRS Detection Algorithm for Arrhythmia Diagnosis", International Conference on Advances in Electrical, Electronic and Systems Engineering (ICAESE 2016), 14-16 November 2016 in Putrajaya, Malaysia.

7. Hari Sankar S., Suraj B., Jayadev K., Aparna P., “A comprehensive solution to road traffic accident detection and ambulance management”, International Conference on Advances in Electrical, Electronic and Systems Engineering (ICAEESE 2016), 14-16 November, 2016 in Putrajaya, Malaysia
8. Chandrika B.K., Aparna P., Sumam David S., “Irreversible wavelet compression of radiological images based on visual threshold”, IEEE International Women in Engineering Conference on Electrical and Computer Engineering, 19-20 December 2015, Dhaka, Bangladesh.
9. Chandrika B.K., Aparna P., Sumam David, “Symmetry Based Perceptually Lossless Compression of 3D Medical Images in Spatial Domain”, International Conference on Computer, Communication, and Control Technology (I4CT, 2014), Malaysia, September 2014.
10. Parameshwari, D.S., Aparna P., “An efficient algorithm for textural feature extraction and detection of tumors for a class of brain MR imaging applications”, 19th International Conference on Digital Signal Processing (DSP), 2014, Hong Kong, Publication Year: 2014 , Page(s): 339 – 344
11. Aparna P, Shreyas S Hanchinal, Preetham N, Kishore Subramanian B, “Comparative study of Canny Edge Detection Algorithm for Diagnosis of Retinopathy of Prematurity”, International Engineering Symposium (IES-2013), Kumamoto University, Japan, 4 - 6 March, 2013.
12. Ashwini V R and Aparna P, “ A Nearest Neighbor Based Approach for Classifying Epileptic form EEG Using NonLinear DWT Features”, International Conference on Signal Processing and Communications, Indian Institute of Science, Bangalore, July 22-25 2012.
13. Aparna P, Sumam David,” Low complexity distributed video coding with Golay codes” 2011 3rd International Conference on Machine Learning and Computing (ICMLC 2011), Singapore, February 26-28, 2011.
14. Aparna P, Sumam David,” Multilevel Coset coding of video with Golay codes”, IEEE Symposium on Computer and Informatics (ISCI 2011), Kuala Lumpur, Malaysia, March 20-22, 2011.
15. Sivaprakash Reddy, Aparna P & Sumam David, “Syndrome coding of Video with LDPC codes”, 9th International Conference on Signal Processing, Beijing, China, 24-29 October 2008.
16. Aparna P, Sumam David S,” Efficient Compression of video using distributed source coding”, National Conference on Computer Vision, Pattern Recognition Image Processing & Graphics, NCVPRIPG08 DAIICT Gandhinagar, Jan 11-13, 2008.
17. Aparna P and Sumam David, Adaptive Local Cosine transform for Seismic Image Compression, *ADCOM 2006*, NITK, Surathkal Dec 20-23, 2006.
18. Aparna P. and Sumam David, *Seismic Data Compression using fast wavelets*, PGFEST 2006, NMAMIT, Nitte.

Workshops Organized:

1. Five Days Short-term Training program (STTP) on “Speech, Audio and Music Processing (SAMP 2020)”, during January 28th – February 1st, 2020 under NITK DJY 2019-20 funding.

- 2.
3. Five Days short-term training program (STTP) on “Algorithms and Architectures for High Efficient Video Processing Systems” from August 20-24, 2018 under TEQIP-III.
4. Two-days workshop on “Embedded Systems Development” for the faculty and students of NITK and faculty of other Engineering colleges. During April 12th and 13th 2013, sponsored by TEQIP-II in EC Seminar Hall.
5. One Day workshop was organized for UG Students on “Cypress Programmable Systems on Chip” on 26th July 2012, in EC Seminar Hall
6. Two days workshop on “Project Development using Intel Atom Processor”, at NITK, on 6th and 7th Jan 2012.
7. Two Days workshop on ARM Architecture and Applications on March 9th and 10th 2009.

Workshops Attended:

1. Summer school on “Speaker recognition and Diarization”, at DA-IICT Gandhinagar during July 6th to 10th, 2019.
2. Short term course on Advanced DSP design techniques during July 10-14, 2017 at IITKGP
3. Short course on Electromagnetic Waves by Dr. P. Subbanna Bhat. Oct 8-12 2015, EC Dept NITK.
4. Mathematical Morphology and its applications in Image Processing during July 14 – 25, 2015, sponsored by TEQIP-II in EC Dept NITK.
5. Faculty Workshop on Teaching DSP Hands-on at IIT Hyderabad, 20-21 May, 2015
6. Workshop on Digital Video Analytics and Processing at IITM on 21-22 December, 2012
7. Indo-U.S. Symposium on Women in engineering entitled ‘Women Engineers Leading Global Innovation’, 29th to 31st August, 2012, in Bangalore.
8. 2012 Intel Embedded Research & Education Summit- in Chandler, Arizona, USA, February, 22-24 2012
9. Intel-IISc Embedded Curriculum Initiative – Authors Workshop, at IISc, Bangalore, on 20th and 21st October 2011.
10. IEEE Symposium on Computer and Informatics (ISCI 2011), Kuala Lumpur, Malaysia, March 20-22, 2011.
11. Two day workshop on Xilinx Embedded Design Flow workshop, at NITK, 5th & 6th February, 2010.
12. Two day workshop on FPGA System Design using Altera Tools, at NITK, 22nd & 23rd August 2009.
13. Faculty Training Program on Instructional Design & Delivery by NITTTR, at NITK, Surathkal, Aug 22-24 2008.

14. One day workshop on Signal Processing on Stretch Configurable Processor at MDN, Manipal, on July 5th.

15. Induction training for fresh teachers in technical institution, at NITK on June 9, 2008.

Guest Lectures Given:

1. Technical Talk on “Introduction to digital Signal Compression”, in Alva’s Institute Of Engineering and Technology on 14-05-2015.

2. Technical Talk on “Embedded Systems with ARM”, in National Conference on *Building Embedded Systems with ARM Cortex-M MCUs*, at Department of Electronics & Communication Engineering, University College of Engineering Kakinada (a), Jawaharlal Nehru Technological University, Kakinada on 18-12-2015

3. Invited speaker at St. Joseph College of Engineering, Mangalore on May 12th 2016 to deliver a talk on “Embedded Systems with ARM”.

4. Invited speaker at *Two Day workshop on Emerging Trends in Wireless Communication and Signal Processing*. organized by On 18th March 2017

5. Invited speaker at *International Conference on Recent Trends in Electrical Sciences and Medical Engineering (ICRITESME)* organized by Electrical stream Departments, Manipal Institute of Technology, Manipal on August 8th 2017.

6. Keynote Speaker in CSIR-DRDO-ISRO Sponsored XIV National Conference on Control Instrumentation System Conference (CISCON-2017) on 3rd November 2017 organized by The Department of Instrumentation and Control Engineering, MIT, Manipal. Topic “Role of Embedded systems in Instrumentation”

Awards:

1. Best Paper of the Track in IEEE WIECON--ECE 2015 Track Name: Multimedia and Signal Processing Irreversible Wavelet Compression of Radiological Images Based on Visual Threshold

2. Best Paper Award' in the area of Information Processing and Automation for paper #1570297822 ('A comprehensive solution to road traffic accident detection and ambulance management' in ICAEESSE 2016, Malaysia

Others:

1. Chaired a session, “**Computational applications**” in CSIR-DRDO-ISRO Sponsored XIV National Conference on Control Instrumentation System Conference (CISCON-2017) on 3rd November 2017 organized by The Department of Instrumentation and Control Engineering, MIT, Manipal.

Sponsored Research Projects:

1. Under: Special Manpower Development Program for Chips to System design (SMDP3)

(MCIT, Govt Of India).

Title of the project: Development and implementation of Photoplethysmography (PPG) and Electro Cardiogram (ECG) acquisition and processing system on a chip.

2. Sponsored research project submitted to Electronics & Radar Development Establishment (LRDE), DRDO, Bangalore. (9.63Lacs)

Title: Study of Sigma Delta Space Time Adaptive Processing Techniques for GMTI using AESA Radar

Educational Materials developed:

Development of Lab Manual for Microprocessor Lab for ARM7 boards.

Development of Embedded Systems Lab

Contribution to Departmental Activities:

1. In charge of Departmental Library.
2. In charge of Microprocessor and Embedded systems Lab.
3. Time table Incharge from May2013 to May2015
4. Faculty Advisor 2011-2012, 2012-2013, 2013-2014 for 3years