P. Essaki Muthu

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Career Highlights:

- Research professional with 21 years of research and development with teaching experience in Industry and Academia
- Conducted research in the areas of video transcoding, video analytics, bitrate control, video characteristics, video compression, perceptual video quality control, video filters, cryptography, wavelets and data compression leading to several publications in refered journals and international conferences
- Combination of Research, Development, Debugging, Testing and Quality Benchmarking professional
- Principal Inventor of five patents
- Collaborated with IISc for conducting research in video compression
- In academia, led several initiatives including Industry-Institute-Interaction, Accreditation Co-ordination, ISO certification, Co-ordination of Exams, heading placement office, Special Course Co-ordination (Laser Technology) & Internal Quality Audit

Chief Scientist in Research and Development
RiverSilica Technologies Pvt Ltd, Bangalore (Nov 2008 – till date)

- H.265 Encoding architecture
- Gstreamer pipeline
- Complete H.264 Decoder and Encoder Architecture
- Reusing techniques of decoded information from MPEG2, MPEG4, H.264
- Bitrate Control
- Perceptual Video Control
- Frame Characteristics Detection
- Encoder Quality Enhancement and Control
- Video MCTF Filters
- Frame rate control
- Altering and tailoring original algorithms to Hardware implementation friendly
- Thorough understanding of x264 and JM reference Softwares
- Elecard, Bitrate viewer, Parabola and many softwares are used for comformance analysis
- Creation of Testing Environment
- Debugging the complete code
- Benchmarking and Quality Evaluation Models
- Knowledge on
    - MATLAB, C
    - Elecard, Parabola Explorer, HEX Editor
    - Excel (Testing and analysis), Word, Powerpoint, OneNote
    - TightVNC, WINSCP, mPutty, CYGWIN, CVS, Mantis

Patents

1. Mode decision for intra prediction in video coding - WO2015015404 - Intra
2. Optimal Temporal Predictive Mode decision - WO2015015436 - Inter
3. Hierarchical motion sampling and re-estimation for a resized video - WO2015025237 - HMSR

4. Method and system to control bit rate in video encoding - WO2015071865 - Bitrate
5. Method and system to detect and utilize different frame characterstics of video sequences - WO2015092665 - SAND

Administrative Skill

1. Inventory Control
2. HR recruitment and policy control
3. Operations

Professor and Head, (Nov 2005 – May 2008) Asst Professor, (Jun 1996 – Nov 2005) Dept. of ECE in MVJ College of Engineering, Bangalore

- Compression and reconstruction of Image using DWT – 2008
- Research on Reconstruction Error at both ends of a medical data – 2007
- Research on Relation on Bit decimation and Energy Packing Efficiency – 2006
- Compression and reconstruction of 1D Data using DWT – 2005
- Compression and reconstruction of 1D Electrical Signal using MatLab – 2004
- 'C' Coding for most of the algorithms in Number Theory – Cryptography – 2003
- Standard Filter Design and Coding – MatLab5.1 – 2002
- A viable communication setup between Mine – 1 and Mine – 2 (A closer look on Optical Fiber Networks) – 2001
- Digital Frequency Synthesizer – 1996
- Personal Intercom system between branch offices – 1994

Publications and Presentations:

- Essaki Muthu, 2017, 'OTT-Significance & Technologies', Broadcast Engineering Society (India) Chennai Chapter, 22-09-2017, Annual Midterm Symposium – Invited Lecture
- Essaki Muthu, P, Gemson, 2014, 'Swift Compressed domain residue calculation in I4X4 Mode Decision based on Integer Transform in H.264 Encoder', Journal of Theoretical and Applied Information Technology - http://www.jatit.org/volumes/Vol67No3/5Vol67No3.pdf
- Essaki Muthu, Gemson, 2014, 'Compressed Domain H.264 Baseline Encoder in Video Transcoding Architecture', International Journal of Engineering and Technology - http://www.enggjournals.com/ijet/docs/IJET14-06-04-053.pdf
- Essaki Muthu, P, Gemson, 2012, 'Estimation of Bitlength of Transformed-Quantized Residue Coefficients with Context Information and its Syntax Elements for mode decision in H.264 Baseline Encoder', International Journal of Computer Engineering Technology, vol. 3, no. 3, pp. 168-183
- Essaki Muthu, P, Gemson, 2012, 'A Computationally efficient method to find Transformed residue coefficients in Intra 4x4 mode decision in H.264 Encoder', International Journal of Electronics and Communication Engineering & Technology, vol. 3, no. 3, pp. 84-102
- Essaki Muthu, P 2012, 'Optimized Reduction of Bitrate by rejecting the coding of Macroblock coefficient based on its Coefficient Cost in H.264 Encoder', National Conference on Computer Communication and Advanced Computing, SIT, Bangalore
- Essaki Muthu, P 2010, 'Reduction of Bitrate by Cost calculation and Macroblock level Thresholding technique in H.264 Encoder', in Conference Proceedings of **IEEE** International Conference on CCC Technologies, pp. 670-676
- Essaki Muthu, P 2008, 'Relation between Compression Ratio and Bit Decimation and Percent RMS Difference and Energy Packing Efficiency based on a Discrete Wavelet based Data Compression using Sub band Coding Technique', International Conference on Image, Signal and Vision Computing, Venice, Italy
- Essaki Muthu, P 2008, 'Relation between Compression Ratio & Bit Decimation and Percent RMS Difference & Energy Packing Efficiency based on a Discrete Wavelet based Data Compression

using Sub band Coding Technique', International Journal of Computer Science, World Academy of Science, Engineering and Technology, USA, Aug'08

Essaki Muthu, 2006, Experiment on Wavelet based Data Compression using sub band coding, National conference on Recent Technology, CMR Institute of Technology, Bangalore, September 2006

Qualification:

- **PhD**, Compressed Domain Video Transcoding in compliance with H.264 (2014)
  Dr. MGR Educational and Research Institute, Chennai
- **M. Tech**., Digital Electronics and Communication Engg (1999 – 2001)
  Manipal Institute of Technology – First Rank
- **B. E**., Electronics and Communication Engg (1992 – 1996)
  National Engineering College, Kovilpatti – University 9th Rank

Trainings Undergone:

- Two weeks on "Industrial applications of Laser Technology", LASER CHEVAL, PIREY, FRANCE, September 2003
- A week on "Laser Technology", Government Tool Room and Training Center, Mysore, 2002

Awards & Recognitions:

- Best Teacher in 2006-07, 2004-05, 2001-02
- First Rank in M. Tech in Manipal Academy of Higher Education in 2001
- Ninth Rank in B. E. in Manonmaniam Sundaranar University in 1996
- Third Rank in B. E. in NEC – ECE Department in 1996
- Gold Medalist in four subjects in SSLC in 1989
- Third Rank in National Talent Search Examination in 1984