

JITHENDRA KUMAR PARUCHURI

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OBJECTIVE:

To obtain a challenging research position to utilize my advanced education and my strong modeling, prototyping and problem-solving skills in the areas of Signal Processing, Image/Audio/Video Processing, Computer Vision & Multimedia networking.

EDUCATION:

- PhD Electrical & Computer Engineering, University of Kentucky (GPA: 4.0/4.0)
 - Topic: Privacy Enhanced Human-centric Video Monitoring
 - Committee: Dr Samson Cheung (chair), Dr Kevin Donohue (co-chair), Dr Yu-Ming Zhang, Dr Johne Parker and Dr Neelkamal Soares
- MS Electrical & Computer Engineering, University of Kentucky, 2008 (GPA: 4.0/4.0)
 - Topic: Rate Distortion Optimized Compression Domain Video Data-Hiding using H263 Codec
 - Advisor: Dr Samson Cheung
- B.Tech Electronics & Communications Engineering, JNTU Hyderabad, India, 2005 (GPA ~ 3.8/4.0)

PROFESSIONAL EXPERIENCE:

Graduate Research Assistant

Multimedia Information Analysis Lab (MIALAB)

CVVE, University of Kentucky, Lexington, KY- 40507

- Research on developing a novel privacy protection multimedia technology as part of the project '**Privacy Protected Video Surveillance**' (Funded by Department of Justice, National Institute of Justice)
- Developed efficient compression domain video watermarking algorithms with high embedding capacity and low perceptual distortion.
- Proposed novel rate-distortion optimized QIM & reversible data hiding algorithms.
- Investigated techniques for Privacy Protection of Human speech.
- Developed secure software agent architecture for privacy data management.
- Developed a content based image search engine based on affine invariant features like SIFT & MSER for the project '**Large Rapidly Deployable Immersive Visualization for Training and Simulation in Urban Terrains**' funded by United States Army.
- Developed a novel Background Subtraction (BGS) technique suitable for indoor video surveillance based on Spatially Adaptive Illumination Compensation.
- Proposed an E-M algorithm based illumination compensation technique which can bring in the robustness in multi-modal codebook based BGS algorithms to rapid illumination changes.

- Working on developing a novel privacy enhanced video monitoring technology called **VIBE** (Video Interface for Behavioral Evaluation) which is useful in detecting and treating disruptive behaviors in children.
- Working on developing a tracking technique across distributed camera mote sensor network and fusion of HOG based people detector with background subtraction.

Graduate Research Intern

(Jan 2009 to Apr 2009)

Hewlett Packard Research Labs (HP LABS, <http://www.hpl.hp.com/>)

Bangalore, India

- Investigated techniques for secure image authentication which are robust over the print scan channel.
- Developed a print scan channel robust document image authentication system which can detect forgeries.
- Used Fourier descriptor based features to generate digital signature of text document images.

Teaching Assistant

(Fall 2009 - Fall 2010)

Department of ECE, UKY

- Intelligent Video Surveillance(EE 639), Communication & Switching Networks(EE 586), Stochastic Systems(EE 640) and Advanced Computer Architecture(EE/CS 480).
- Teaching course prerequisites, conducting recitation sessions and makeup lectures, grading exams, projects, homework's and quizzes.

Research Programmer/Consultant

(May 2008 to Aug 2008)

Washington Software & Youku

- Developed a Content based video search engine for retrieving similar videos from huge flash video database
- Using C++, FFMPEG, OPENCV and BERKELEYDB in 64 bit Linux machine
- Implemented a random projection based video signature technique – VISIG.
- Ordinal Features as video features and power spectrum bands as audio features
- Achieved above 95% recall and precision targets with minimal time complexity for search query
- Also developed clustering algorithms to improve the recall of similar videos.

PATENTS & PUBLICATIONS:

- S-C. Cheung, J.K. Paruchuri and W. Zhang. 2007. **Hiding Privacy Information in Surveillance Video** – University of Kentucky Intellectual Property 1459. United States Patent Pending.
- J.K. Paruchuri and S-C. Cheung. **Regression Based Illumination Compensation For Robust Background Subtraction** – In Preparation for IEEE Transactions on Pattern Analysis & Machine Intelligence (TPAMI).
- J.K. Paruchuri, Edwin S., S-C. Cheung and Cheng-Hao. 2011. **Spatially Adaptive Illumination Modeling for Background Subtraction**. –International Conference on Computer Vision (ICCV) Workshop on Visual Surveillance, November 6-13 2011, Barcelona, Spain.
- J.K. Paruchuri and S-C- Cheung. 2011. **Managing Privacy Information in Video Surveillance Systems**. – Book Chapter submitted to **Effective Surveillance for Homeland Security: Balancing Technology and Social Issues**, CRC Press / Taylor & Francis.
- J.K. Paruchuri, S-C. Cheung and M Hail. 2009. **Video Data-Hiding for Managing Privacy Information in Surveillance Systems**. - EURASIP Journal on Information Security: Special Issue on Privacy Protection in Multimedia Systems, Sep 2009.

- J.K. Paruchuri and S.-C. Cheung. 2008. **Joint Optimization of Data-Hiding and Video Compression.**- In IEEE International Symposium on Circuits and Systems (ISCAS 08), May 18-21 2008, Seattle, Washington, US.
- S.-C. Cheung, J.K. Paruchuri and T. Nguyen. 2008. **Managing Privacy Data in Pervasive Camera Networks.** In IEEE International Conference on Image Processing (ICIP 08 – Special Session), Oct 12-15, San Diego, CA, US.
- S.C- Cheung, M.Vijay, J.K. Paruchuri, J. Zhao, T. Nguyen. 2009. **Protecting and Managing Privacy Information in Video Surveillance Systems.** – Book Chapter in **Protecting Privacy in Video Surveillance** – Ed: Andrew Senior, Springer, ISBN: 978-1-84882-300-6.
- S.C- Cheung, J. Chaudhari and J.K. Paruchuri. 2007. **Privacy Protection of Human Speech.** In IEEE Pervasive Computing, Work In Progress, Winter 2007, page 75.

AWARDS & ACHIEVEMENTS:

- Recipient of prestigious **Presidential Fellowship** 2010-11 for best dissertation topic from Graduate school, University of Kentucky.
- Received **International Student Scholarship** from Office of International Affairs, University of Kentucky and **Kentucky Graduate Scholarship** from Graduate School.
- Research profile published in **Marquis Who`s Who in America**, 2010 and **Marquis Who`s Who in Science and Engineering**, 2011.
- Awarded a **Gold Medal and Scholarship** for my performance in 10+2 level from the **Government of Andhra Pradesh, India** and merit award from my undergraduate college for being the **Topper** of the class for **four years consistently**.
- UKY ECE department nominated candidate for Microsoft Research Fellowship and IBM Research Fellowship.

TALKS & PRESENTATIONS:

- IEEE International Conference on Image Processing (ICIP 08), San Diego - **“Managing Privacy Data in Pervasive Camera Networks.”**, Oct 2008.
- Hewlett Packard Labs, Bangalore - **“Protecting and Managing Privacy Information in Video Surveillance Systems.”**, Feb 2009.
- Hewlett Packard Labs, Bangalore - **“Text Document Image Integrity Verification.”**, May 2009.
- UKY Graduate School Interdisciplinary Conference, Lexington – **“Privacy Enhanced Human-centric Video Monitoring.”**, April 2010.

TECHNICAL SKILLS:

- Os: Windows, Linux, Contiki, Tinyos
- Languages: C, C++(STL), Java, MATLAB, Visual studio MFC
- Scripting Languages: PERL, Javascript
- Hardware Languages: Verilog, VHDL
- Databases: Berkeleydb, Oracle 8
- Web: HTML, PHP
- Image/Video Libraries: OpenCV, OpenGL, CUDA, VideoLab, FFMPEG, ImageMagick
- DSP: TMS320C6000 IDK, Code Composer Studio.
- Networking – Wireshark, NS2, OPNET
- Cameras: 1394, USB, Axis IP, CITRIC Embedded, Vivotek PTZ

- Image/Video Coding: JPEG, JPEG2000, H263, H264 AVC/SVC, VP8, MPEG
- Speech/Audio Coding: AMR, EVRC, MP3, AAC
- Other: LATEX, MS Office

PROFESSIONAL ACTIVITIES:

- Student Member, IEEE; Affiliate Member, MMSP.
- Reviewed papers for various IEEE/EURASIP conferences and journals like ICIP, ICME, ICASSP, ISCAS, ICCV, CVPR, TCSVT, T Multimedia, MTAP, JSS etc.
- Assisted in writing grant proposals including “A New VIBE (Video Interface Behavioral Evaluation): A Novel Technology to Evaluate Childhood Disruptive Behavior Disorders”.
- Mentored summer undergrad student on 8 week project - *Image enhancements for Children's E-books*

GRADUATE COURSES & PROJECTS:

Digital Signal Processing, Deterministic Systems, Real Time Embedded Computing Systems, Digital Image Processing, Computer Vision, Probabilistic Graphical Models, Stochastic systems, Audio Signals and Systems, Digital Computer Structure, Linear Algebra, Security Engineering, Computer Graphics, Error Correcting Codes, Multimedia Systems, Computer Networks, Statistical Learning, Technical Writing.

- Image Compression and Decompression using Wavelet Transform (Undergrad Project)
- Probabilistic Image Steganalysis (Graphical Models Course Project)
- High Content Assay Image Analysis (Image Processing Course Project)
- Composite Pattern Structured Light illumination (DSP Course project)
- Verilog implementation of 16 bit RISC computer (Computer Architecture course project)
- Word Classifier (Audio Processing Course Project)
- Virtual Living Room Design (Computer Graphics Course Project)

MISCELLANEOUS

Citizenship: India

US Visa: F-1

REFERENCES

Dr. Sen-ching Samson Cheung
Associate Professor, ECE Department & Visualization Center
University of Kentucky, Lexington, KY
Email: cheung@engr.uky.edu; Tel: 859-218-0299

Dr. Kevin D. Donohue
Data Beam Professor, ECE Department & Visualization Center
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