

# Chuohao Yeo

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## CONTACT INFORMATION

Signal Processing Department, Institute for Infocomm Research  
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## RESEARCH INTERESTS

My main area of interest is signal processing, and more specifically image and video processing, compression and communications. I am particularly interested in developing state-of-the-art techniques that can drastically boost video compression efficiency at reasonable computational costs. I am also interested in scalability issues in the distribution of video content, and in error-resilience issues in low-latency video applications such as video-conferencing.

## EDUCATION

**University of California, Berkeley**, Berkeley, CA **2004-2009**

Ph.D., Electrical Engineering and Computer Sciences

- Thesis: "Signal processing meets computer vision: Overcoming challenges in wireless camera networks"
- Advisor: Prof. Kannan Ramchandran
- Designated Emphasis in Communication, Computation and Statistics

Certificate in Management of Technology

- Modules include "Future of IT", "International trade and competition in high tech", "Technology strategy" and "Economics of Information"

**Massachusetts Institute of Technology**, Cambridge, MA **1998-2002**

M.Eng., Electrical Engineering and Computer Sciences

- Thesis: "An Investigation of Methods for Digital Television Format Conversions"
- Advisor: Prof. Jae S. Lim

S.B., Electrical Science and Engineering

- Minor in Economics

## WORK EXPERIENCE *Research Engineer*

July 2009 onwards

**Institute for Infocomm Research**

Singapore

Responsible for research into high performance video coding techniques to further improve video compression efficiency.

*Graduate Student Researcher*

Fall 2005 to Spring 2009

**University of California, Berkeley**

Berkeley, California USA

Conducted research on distributed video compression and camera calibration in multi-camera networks and on efficient action recognition and group dynamics analysis using compressed video. Mentored students doing undergraduate research.

*Research Intern*

Summer 2008

**Hewlett-Packard Labs**

Palo Alto, California USA

Investigated and implemented low-latency, error resilient high-definition video transmission.

*Research Intern*

Feb 2008

**IDIAP**

Martigny, Valais, Switzerland

Investigated multi-modal modeling of meeting videos. Modified *xvid* to create software library for compressed domain processing of MPEG-4 videos.

WORK EXPERIENCE (CONTINUED) *Graduate Student Instructor* Fall 2006  
**University of California, Berkeley** Berkeley, California USA  
 Taught discussion sections for Digital Signal Processing (undergraduate class). Designed, administered and graded class exams.

*Intern* Summer 2005  
**Omnivision Technologies, Inc.** Sunnyvale, California USA  
 Implemented and tested video processing algorithms for CMOS camera chips.

*Research Engineer* Summer 2004  
**Institute for Infocomm Research** Singapore  
 Conducted research in the field of media analysis, specifically on the detection of picture-in-picture like sub-windows in news video.

*Combat Medic Specialist* Fall 2002 to Spring 2004  
**Singapore Armed Forces** Singapore  
 Involved in overseeing the day-to-day running of a medical center. Worked on software projects to improve the efficiency of medical logistics. Took part in providing medical coverage for events such as National Day Parade.

*Research Assistant* Fall 2001 to Spring 2002  
**Massachusetts Institute of Technology** Cambridge, Massachusetts USA  
 Conducted research on HDTV format conversion and resolution enhancement, focusing on specific format conversions and various methods of conversion.

*Intern* Summer 2001  
**Federal Communications Commission** Washington DC USA  
 Investigated engineering issues and studied public policy implications in spectrum sharing between satellite and terrestrial broadcasters, and in spectrum sharing between Ultra-WideBand systems and traditional communications systems.

JOURNAL PUBLICATIONS

C. Yeo, P. Ahammad, K. Ramchandran and S. S. Sastry, "High speed action recognition and localization in compressed domain videos," in *IEEE Transactions on Circuits and Systems for Video Technology*, Aug 2008.

C. Yeo and K. Ramchandran, "Robust distributed multi-view video compression for wireless camera networks," accepted for publication in *IEEE Transactions on Image Processing*.

D. Schonberg, S. Draper, C. Yeo and K. Ramchandran, "On compression of encrypted image and video sequences," in *IEEE Transactions on Information Forensics and Security*, Dec 2008.

D. Jayagopi, H. Hung, C. Yeo and D. Gatica-Perez, "Modeling dominance in group conversations using non-verbal activity cues," in *IEEE Transactions on Audio, Speech and Language Processing*, Mar 2009.

C. Yeo, P. Ahammad and K. Ramchandran, "Distributed rate-efficient visual correspondences for mobile wireless camera networks," submitted to *International Journal of Computer Vision*.

H. Hung, C. Yeo and G. Friedland, "Approaching On-line Audio-visual Association through Aspects of Human Discourse," submitted to *Computer Vision and Image Understanding*.

- C. Yeo and K. Ramchandran, "On low-complexity video encoding through feedback," in *IEEE International Conference in Image Processing*, 2009.
- G. Friedland, C. Yeo and H. Hung, "Visual speaker localization aided by acoustic models," in *ACM Multimedia*, 2009.
- C. Yeo, P. Ahammad, H. Zhang and K. Ramchandran, "Rate-constrained distributed distance testing and its applications," in *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2009.
- C. Yeo, W.-T. Tan and D. Mukherjee, "Receiver error concealment using acknowledge preview (RECAP) - an approach to resilient video streaming," in *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2009.
- H. Zhang, C. Yeo and K. Ramchandran, "Rate efficient remote video file synchronization," in *IEEE International Conference on Acoustics, Speech, and Signal Processing*, 2009. **Finalist for Best Student Paper Award**
- H. Zhang, C. Yeo and K. Ramchandran, "VSYNC - A video file synchronization protocol," in *ACM Multimedia*, 2008. **Best Short Paper Award**
- C. Yeo, P. Ahammad and K. Ramchandran, "Rate-efficient visual correspondences using random projections," in *IEEE International Conference in Image Processing*, 2008.
- C. Yeo, P. Ahammad and K. Ramchandran, "A rate-efficient approach for establishing visual correspondences via distributed source coding," in *SPIE Visual Communications and Image Processing*, 2008.
- P. Ahammad, C. Yeo, K. Ramchandran and S. S. Sastry, "Unsupervised discovery of action hierarchies in large collections of activity videos," in *IEEE International Workshop on Multimedia Signal Processing*, 2007.
- H. Hung, D. Jayagopi, C. Yeo, G. Friedland, S. Ba, J.-M. Odobez, K. Ramchandran, N. Mirghafori and D. Gatica-Perez, "Using audio and video features to classify the most dominant person in a group meeting," in *ACM Multimedia*, 2007.
- C. Yeo, J. Wang and K. Ramchandran, "View synthesis for robust distributed video compression in wireless camera networks," in *IEEE International Conference in Image Processing*, 2007.
- J. Wang, C. Yeo, V. Prabhakaran and K. Ramchandran, "On the role of helpers in peer-to-peer file download systems: design, analysis and simulation," in *International Workshop on Peer-to-Peer Systems*, 2007.
- C. Yeo and K. Ramchandran, "Robust distributed multiview video compression for wireless camera networks," in *SPIE Visual Communications and Image Processing*, 2007. **Best Student Paper Award**
- C. Yeo, P. Ahammad, K. Ramchandran and S. S. Sastry, "Compressed Domain Real-time Action Recognition," in *IEEE International Workshop on Multimedia Signal Processing*, 2006.

TECHNICAL REPORTS	<p>C. Yeo, "Signal processing meets computer vision: Overcoming challenges in wireless camera networks," <i>Ph.D. Thesis, UC Berkeley</i>, 2009.</p> <p>C. Yeo and K. Ramchandran, "Compressed domain video processing for activity estimation in dominance classification and slide transition detection," <i>Technical Report, UC Berkeley</i>, 2008.</p> <p>C. Yeo, "An Investigation of Methods for Digital Television Format Conversions," <i>M.Eng. Thesis, MIT</i>, 2002.</p>
COMPUTER SKILLS	<ul style="list-style-type: none"> <li>• Familiar with Windows, Cygwin, Linux, Visual Studio, GNU software.</li> <li>• Programming proficiency: C, C++, MATLAB, Perl, Assembly.</li> </ul>
SERVICE	<ul style="list-style-type: none"> <li>• Active reviewer for prestigious journals and conferences including IEEE Transactions on Image Processing; IEEE Transactions on Circuit and Systems for Video Technology; Elsevier Image and Vision Computing; IEEE International Conference on Image Processing; IEEE International Conference on Acoustics, Speech and Signal Processing; Picture Coding Symposium.</li> <li>• Student reviewer for Berkeley graduate school applications, S2009.</li> <li>• UC Berkeley, Organized research group seminars, F2006, S2007, F2008.</li> <li>• Massachusetts Institute of Technology, HKN, Social Chair, 2001-2002.</li> <li>• Massachusetts Institute of Technology, HKN Tutoring Program, 2001.</li> <li>• Massachusetts Institute of Technology, Associate Advisor for Freshmen, 2000.</li> <li>• Singapore Students Associations Leadership Conference, Steering Committee Member, 2000-2001.</li> <li>• Massachusetts Institute of Technology, Singapore Students Society, President, 2000-2001.</li> <li>• Massachusetts Institute of Technology, Singapore Students Society, Vice-President, 1999-2000.</li> </ul>
HONORS AND AWARDS	<p>2004-2009 - Agency for Science, Technology and Research (Singapore) National Science Scholar. Award covers full tuition and living allowances.</p> <p>2003 - Overall Best Trainee in Combat Medic Specialist Course (Singapore Armed Forces).</p> <p>1998-2002 - Public Service Commission (Singapore) Overseas Merit Scholar. Award covers full tuition and living allowances.</p> <p>1998 - Platoon Best Trainee in Combat Medic Course (Singapore Armed Forces).</p> <p>1998 - Lee Kuan Yew Award for Mathematics and Science (Singapore).</p> <p>1997 - International Physics Olympiad, Silver Medal.</p> <p>1996 - Singapore Physics Olympiad, Gold Medal and Overall Best Performer.</p> <p>1996 - Singapore Chemistry Olympiad, Gold Medal and Overall Best Performer.</p> <p>1996 - International Olympiad in Informatics, Honorable Mention.</p> <p>1994 - International Olympiad in Informatics, Member of National Team.</p>
MEMBERSHIP	IEEE, Tau Beta Pi, Eta Kappa Nu, Phi Beta Kappa
OTHER INTERESTS	Technology, current affairs, history, music and jogging.