

## Error-Resilient Visual Communication

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### Research Goal

- Investigate the error propagation effect in an MHMCP coder
  - Analyze the rate-distortion performance in terms of the hypothesis number and hypothesis coefficients
- Design MHMCP coder to improve error resilient capability
  - Adapt hypothesis number
  - Adapt hypothesis coefficients

### Role in IMSC

- Techniques of continuous media streaming play an important role in IMSC strategic plan
  - Examples include video streaming, mobile phone, telemedicine etc
- Transmission errors are inevitable in wireless channels or Internet
  - Error resilient coding is necessary to be integrated.

### Research Approach

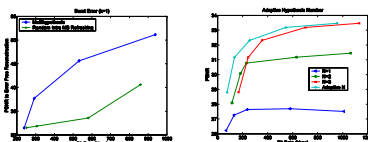
- Predict a Macroblock (MB) from a weighted superposition of more than one reference MBs
- By carefully selecting the hypotheses and their weighting coefficients
  - Achieve coding gain
  - Enhance error resilience

### Accomplishments

- Several design principles for the MHMCP coder are derived
- Up to 5dB PSNR improvement comparing video codec with single hypothesis
- Publications
  - Error resilience analysis of multi-hypothesis motion compensated prediction for video coding, *Proc. ICIP*, Singapore, Oct. 2004
  - Error resilient video transmission with multi-hypothesis motion compensated prediction, *Proc. ISCAS*, Vancouver, Canada, May, 2004

### Uniqueness & Related Work

- A thorough analysis of the error resilience property of MHMCP is given
- An adaptive MHMCP codec is designed



### 5-Year Plan

- Continue to develop new error resilient schemes
- Develop content and channel adaptive coding and networking protocols for QoS
- Seek major breakthrough in next generation multimedia compression and networking schemes