

# Faculty and Research Interests

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## Education:

Ph.D. in CSIE, National Taiwan University, 1990

## Biography:

- 2009~Current Chair Prof., National Taiwan University of Science and Technology.
- Summer, 1999 Visiting Scholar, University of Washington.
- 1995~2009 Prof., National Taiwan University of Science and Technology.
- 1990~1995 Associate Prof., National Taiwan University of Science and Technology.
- 1989~1990 Lecturer, National Taiwan Normal University.
- 1986~1987 Research Assistant, the Institute of Information Science at Academia Sinica.

## Research Directions:

- Color Image Processing of Digital Camera, H.264 Video Coding.
- Biomedical Signals/Medical Image Processing and Compression.
- Image/Video Compression and Application.
- Communication Theory; Information Security.
- Pattern Recognition; Data Mining; Artificial Intelligence.
- Data Structure; Algorithm; Network Multimedia; Human Machine Interface.
- Industrial Image Processing and Application.

## Research Projects:

- The research project of digital camera color image processing**
  - The project focus on the digital image demosaicing, postprocessing, compression, watermarking, error concealment, zooming algorithm, super-resolution, arbitrary-ratio resizing algorithm, and reversible data hiding techniques.
- The research project of image/video compression: palette, fractal, and hyperspectral image compression and H.264-based error concealment**
  - The project focus on the palette, fractal, hyperspectral image compression, and H.264-based error concealment techniques.
- The research project of 3D processing techniques and applications for entertainment**
  - The project focus on 3D reconstruction and expression, depth map occlusion filling, 3D object skeleton extraction, and 3D object compression techniques.

## Demosaicing Research Results



- The edge directions of a mosaic image are estimated by using adaptive heterogeneity-projection masks.
- Combining the luminance estimation mask and Sobel operator, we can determine the weight of each pixel in the interpolation estimation.
- Based on the objective and subjective measures, the proposed demosaicing algorithm yields better quality performance when compared with several recently published algorithms.

## H.264-based Error Concealment Research Results



- Based on the reversible data hiding technique, the proposed intra-frame error concealment algorithm has no image quality degradation for H.264/AVC sequences.
- A modified circular embedding scheme, which has better recovering advantage when the corrupted macroblocks (MBs) are in FMO mode, is presented to embed motion vectors into MBs in intra-frames.
- The quality of recovered video sequence obtained by the proposed algorithm is indeed superior to several recently published algorithms.

