3F., No.18-5, Lane 13, Yongkang St., Taipei City, Taiwan 106, R.O.C

Tel: +886-937515788 (mobile), +886-2-23972738 (home)

E-mail: b89901043@ntu.edu.tw or pinghao.wu@gmail.com

Ping-Hao Wu

Objective	Ph.D. in the field of Signal Processing. Develop technologies that advance the quality of human life.

Education

2000~2004   **National Taiwan University (NTU), Taipei, Taiwan.**

Bachelor of Science, Electrical Engineering, 06/2004

Overall GPA 3.88/4.00, GPA in major 3.96/4.00

2004~present   **National Taiwan University (NTU), Taipei, Taiwan.**

Master of Science, Communication Engineering, expected 06/2006

Honors

➢ Class A Scholarship of Graduate Institute of Communication Engineering, National Taiwan University, 09/2004~06/2005.

Publications

Journal Paper

➢ Ping-Hao Wu, Chen Chen, and Homer H. Chen, "Rounding Operation in the Transform Domain," submitted to *IEEE Trans. on Circuits and Systems for Video Technology* at Sept. 2005.

Conference Paper

➢ Yu-Lin Chang, Ping-Hao Wu, Shyh-Feng Lin, and Liang-Gee Chen, "Four Field Local Motion Compensated De-Interlacing," in *Proc. IEEE Int. Conf. on Acoustic, Speech, and Signal Processing,* Montreal, Quebec, Canada, May 2004.

➢ Chen Chen, Ping-Hao Wu, and Homer H. Chen, "MPEG-2 to H.264 Transcoding," *Picture Coding Symposium*, San Francisco, USA, Dec. 2004.

➢ Chen Chen, Ping-Hao Wu, and Homer H. Chen, "Transform-domain intra prediction for H.264," in *Proc. IEEE Int. Symposium on Circuits and Systems*, Kobe, Japan, May 2005.

➢ Chen Chen, Ping-Hao Wu, and Homer H. Chen, "A Practical Solution to Transform-Domain Rounding," in *Proc. of the 13th European Signal Processing Conf.* (EUSIPCO 2005), Antalya, Turkey, Sept. 2005.

Work Experience

Teaching Assistant

09/2004~01/2005   Switching Circuit and Logic Design

02/2005~06/2005   Data Structure and Programming

Research Assistant

07/2004~present   Graduate Institution of Communication Engineering, NTU,   Advisor: Homer. H. Chen

Develop MPEG-2 to H.264 Transcoding.

Research Experience

09/2003~01/2004   **<u>Motion Compensated De-Interlacing</u>**   Advisor: Liang-Gee Chen

Develop an algorithm that performs motion estimation on two same-parity fields, and a mode decision module is used to switch to intra-field interpolation when the block is not suitable for MC. The results show high-quality, jag-free, and flicker-free images because of taking the characteristics of interlaced video into consideration.

02/2004~01/2005   **<u>MPEG-2 to H.264 Transcoding</u>**   Advisor: Homer. H. Chen

Propose a transform-domain approach of converting an MPEG-2 bitstream into an H.264 bitstream. Transform-kernel conversion is combined with the down-sampling process to speed up the transcoding. Also, an equivalent operation of intra-prediction in the transform domain is derived.

01/2005~07/2005   **<u>Rounding Operation in the Transform Domain</u>**   Advisor: Homer. H. Chen

Develop an algorithm that minimizes the error caused by the mismatch between the spatial-domain and the transform-domain approaches. The drift error propagated through a series of inter-coded frames is minimized, and thus mage quality is preserved. This algorithm can be applied to any transform-domain manipulation function as long as the rounding operation is presented in its counterpart in the spatial domain.

02/2005~present   **<u>Rate Control for Video Transcoding</u>**   Advisor: Homer. H. Chen

With the information from the input bitstream, a novel rate-quantization model is developed based on the complexity ratio between the input and the output bitstream. This model provides more accurate QP determination given a target bitrate.

Course Projects

Introduction to Digital Signal Processing   <u>JPEG Encoder/Decoder</u>

Implement a complete baseline profile JPEG Encoder and Decoder with C++.

Digital Speech Processing   <u>Adaptive Time Segmentation for Speech Enhancement</u>

Implement an adaptive time segmentation technique, which is used to accurately estimate noisy speech power spectrum, to improve a basic Wiener filter for speech enhancement.

Computer Graphics   <u>Water Animation</u>

Implement a complex dynamic flow system including a discrete 3-D Navier-Stokes equations solver and a ray tracer.

Digital Circuit Lab.   <u>Crazy Maze</u>

Design and implement a game on FPGA. Player needs to control a token to walk out of the maze with sound impulses, usually hand-clapping. Integrate microphone, ADC, filters, FPGA, and a CRT.

Network and Multimedia Lab.   <u>File Manager for Pocket PC</u>

Implement a File Manager similar to the one in Windows on Pocket PC with eMbedded Visual C++. Features include drag&drop and separated list/tree views.

Test Scores	**GRE** - V: 510, Q: 800, AW 4.0, 10/25/2003
	TOEFL - 267, TWE: 5.5, 08/25/2005

Skills	**Hardware description languages**: VHDL, Verilog HDL
	High-level languages: C, C++, Java, MFC, .NET framework, QT, PHP, MySQL.
	Simulation Software: HSpice, Matlab.

Relevant Courses

Graduate Courses

Digital Communication I	Queuing Theory	Computer Graphics
Digital Speech Processing	Information Theory	Internet Telephony

Undergraduate Courses

Probability	Calculus	Differential Equations
Linear Algebra	Computer Programming	Electronics
Electromagnetics	Electric Circuits	Integrated Circuit Design
Signals and Systems	Computer Architecture	Principles of Communications
Control System	Intro. to Multimedia Processing	Intro. to Digital Signal Processing
Digital Circuit Lab.	Network and Multimedia Lab.	Communication Lab.
Data Structure	Electronic Circuit Design	4 Special Projects

Extracurricular Activities

08/2001~01/2002   Minister of the Music Library in the NTU Guitar Club.

02/2002~07/2002   Minister of the Performance Section in the NTU Guitar Club.

08/2002~07/2003   Core member of the Students' Association of the Department of Electrical Engineering.

Interests

- ➢ Swimming, Jogging
- ➢ Play Acoustic Guitar, Electric Bass
- ➢ Jazz, Rock

Reference

Available upon request.