

HONG Z. TAN 张虹

ELATE Fellow Personal & Professional Bio (May 2013)



MY TWO JOBS

These days, I live in Beijing, P.R. China with my family. My paycheck comes from Microsoft. I am a **Senior Researcher & Research Manager** of the Human Computer Interaction Group at Microsoft Research Asia. I have the full support of my boss at Microsoft to participate in the ELATE program.

I am on research leave from Purdue University, where I am a **Professor** of Electrical & Computer Engineering, with courtesy appointments in the School of Mechanical Engineering and the Department of Psychological Sciences. I still supervise Ph.D. students at Purdue.

WHERE I AM FROM

I find this a difficult question to answer. I was born 张虹 in Shanghai, P.R. China, and spend the first 21 years of my life there until I received my bachelor's degree in Biomedical Engineering. I spent the next 12 years in Boston, MA, getting my graduate degrees in EECS from MIT and working there. Another 13 years was spent in West Lafayette, Indiana where I moved up the ranks of professorship at Purdue University. Now I live in Beijing, where I am neither a native nor a foreigner.

MY FAMILY

I met my husband Jamie Tan on the first day that I arrived in Boston (hence the new last name). He received his Ph.D. in Physics from MIT and now is the CTO of a startup company specializing in image search. We were married at the MIT Chapel that I.M. Pei designed. We recently celebrated our Silver Anniversary! My older son Michael participated in my PhD commencement as a toddler with a matching outfit (*photo 1*). He will be a freshman at the Tisch School of the Arts at NYU in the fall, pursuing a career in filmmaking. My younger son Kevin was born when I was a Research Scientist at the MIT Media Lab. He was 10 months old when I started as an assistant professor. These days, Kevin enjoys music making and looks forward to starting his IB program at the International School of Beijing this fall. Since coming to Beijing, we have traveled extensively in China as a family. Our latest trip was during the spring break, to the picture-perfect town of Yang Shuo 阳朔 (*photo 2*).

I know I have chosen the right career path, because I am eager to get out of the bed every morning!



Photo 1. Michael & I, MIT Killian Court, June 1996



Photo 2. (from left to right) Michael, I, Kevin & Jamie, Yang Shuo 阳朔, P.R. China, April 2013

HAPTICS AND I

I work in a field called *Haptics*, which refers to sensing and manipulation through the sense of touch. While touch screens have become prevalent, thanks to iPhone, the screens do not touch us back. We operate our phones and larger screens with what is essentially an anesthetized finger, relying exclusively on sight (and sound) to interact with these devices. It is my dream to restore touch feedback on touch screens, to enable more intuitive, graceful, and (ultimately) eyes-free interactions.

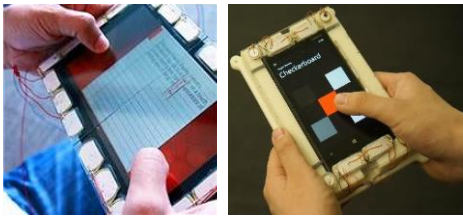


Photo 3. Haptic prototypes we have developed at Microsoft Research Asia



Photo 4. Group photo of the HCI group at Microsoft Research Asia

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Most of us experience touch feedback in the form of buzzing, when our phones are in the silence / vibration mode. Yet haptics can be so much more. At Microsoft Research Asia, one of the technologies we work on uses piezoelectric actuators to resonate a piece of glass at an ultrasonic frequency, which traps a thin layer of air film between the fingertip and the glass surface. By controlling the thickness of the air film, we can instantaneously modulate the surface friction. The change in friction in response to finger movements creates the illusion of different surface textures, causing the finger to feel the different tiles on a phone (*photo 3, right*).

I have been studying haptics for 20+ years now, since when I was a graduate student at MIT. It is a fascinating and interdisciplinary research field, with many of us straddling the intersections of mechanical engineering, computer science, cognitive science, etc. I am best known for my psychophysical studies that inform the design and development of haptic interfaces that match the human sensorimotor capabilities.

CULTURAL LESSONS 2.0

When I left Shanghai for Boston at the age of 21, I expected plenty of cultural shock. I was pleasantly surprised that I did not stand out on MIT campus. When I moved from Boston to West Lafayette at the age of 33, I expected no cultural shock but received plenty once I got to know the way of life in the Midwest. Now that I am running an international group in an American company located in China, I sometimes have difficulty remembering what language to speak, let alone which cultural norm to follow. It has been a challenging and exceeding rewarding experience for me to work with my guys at Microsoft Rsearch Asia (*photo 4*).

SPARE TIME

I am a workaholic with very little chance of recovering. The concept of spare time does not apply to me. Having fun is a deliberate effort, and it goes on my calendar. I am a good cook to my family, on weekends. My husband is an amateur tenor, and he is determined to turn me into an amateur Sarah Brightman so we can sing Karaoke duets (think “You and Me”, the theme song from the 2008 Olympics in Beijing). I play the piano about once a week. I enjoy reading biographies and autobiographies of people who intrigue me. My sons and I are black belts of Taekwondo, a Korean martial art. I get my fix of watching romance movies with happy endings while on the treadmill. I get my daily news updates from my husband, who decides what I should know about current affairs.

If you find yourself heading east to China, please get in touch with me. We will schedule some quality sightseeing time together!