

Memory of Wataru Takahashi

I was really heavily shocked when hearing the sad news that Wataru Takahashi passed away on November 19, 2020. Not only Japan, but the whole world did lose a great mathematician, in particular, in the nonlinear analysis and fixed point theory communities.

Wataru Takahashi's work influenced me significantly. I started to read his papers in later 1980's during my Ph.D. study at Xi'an Jiaotong University by paying attention to nonexpansive retractions and ergodicity of nonlinear mappings and semigroups. Wataru Takahashi was no doubt a top leader in this area. Inspired by Wataru Takahashi's ideas in his paper (The existence of nonexpansive retractions in Banach spaces, *J. Math. Soc. Japan*, 38 (1986), 1-7), jointly with N. Hirano and K. Kido, I wrote a paper "Nonexpansive retractions in uniformly convex Banach spaces" which was published in the *Chinese Science Bulletin*, 35 (1990), 481-484 (in Chinese). Mainly this was the beginning of part of my research in nonlinear operator theory.

I first time met Wataru at the International Workshop on Metric Fixed Point Theory held at Universidad de Sevilla in September 1995. Afterwards, I met him many times in the occasions of international conferences. Wataru was very kind to me and invited me to participate in several international conferences that he organized such as "The International Conference on Nonlinear Analysis and Convex Analysis (NACA)" and "The Asian Conference on Nonlinear Analysis and Optimization (NAO)". I was appreciated to Wataru for accepting my invitation to deliver a plenary speech for the 13th International Conference on Fixed Point Theory and Its Application (ICFPTA-2019) held Henan Normal University, Xinxiang, China from July 9-13, 2019. I also appreciated to Wataru for inviting me to join the editorial boards of the *Journal of Nonlinear and Convex Analysis (JNCA)*, and *Linear and Nonlinear Analysis (LNA)*.

From December 2003-January 2004, I was a Japan Society for the Promotion of Science (JSPS) Invitational Fellow, hosted by Isao Yamada of the Department of Communications and Integrated Systems, Tokyo Institute of Technology. Wataru was very kind to invite me to give a talk for his research group and invited me to have a very delicious dinner.

It was always good memory that Wataru and I were colleagues at National Sun Yat-sen University (NSYSU) in Kaohsiung, Taiwan for five years from Jan 2010 to Jan 2015 before I joined Hangzhou Dianzi University in Feb 2015. Wataru took a honorary Chair professorship offered by the Department of Applied Mathematics for which I was the Chairman and Dean of College of Science coincidentally. It was valuable to mention that I had a joint paper with Wataru (also jointly with Jen-Chih. Yao): Iterative methods for generalized split feasibility problems in Hilbert spaces, *Set-Valued and Variational Analysis*, 23 (2015), no. 2, 205-221. This paper was a web of science highly cited paper. Wataru and I (also with other colleagues) often enjoyed coffee under the bo-tree on the beautiful NSYSU campus, discussing mathematical problems and other issues as well.



Wataru Takahashi was offered another term of honorary chair professor at NSYSU from Feb 1, 2013-Jan 31, 2016.

I always remembered that every time when retuning Kaohsiung from Tokyo, Wataru brought me a pack of sweets. It's deeply sad that I'll never receive such a present from Wataru.

Wataru Takahashi is always remembered.

Hong-Kun Xu (徐洪坤),
Distinguished Professor
Hangzhou Dianzi University
Hangzhou, China
21 February 2021