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## BIOGRAPHICAL SKETCH

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NAME Taguchi, Katsuyuki	POSITION TITLE Assistant Professor		
eRA COMMONS USER NAME ktaguch1			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Tokyo Institute of Technology	B.Sc.	1989	Mech Eng Sci
Tokyo Institute of Technology	M.Sc.	1991	Mech Eng Sci
University of Tsukuba	Ph.D.	2002	Info Sci and Elec Eng

### A. Positions and Honors

#### Positions and Employment

1991-1998 Researcher, Toshiba Medical Systems Corporation, Tochigi, Japan  
1998-2002 Project Researcher, Toshiba Medical Systems Corporation, Tochigi, Japan  
2002-2005 Senior Imaging Scientist, Toshiba America Medical Systems, Tustin, CA  
2005-2007 Instructor, Dept. of Radiology, Johns Hopkins University  
2007-present Assistant Professor, Dept. of Radiology, Johns Hopkins University

#### Other Experience and Professional Memberships

1998-2000 Visiting Scientist, Dept. of Radiology, University of Utah, Salt Lake City, UT  
1998-present Member, Japanese Radiological Society of Technology  
2000-present Member, Japanese Society of Medical Imaging Technology  
2002-present Member, American Association of Physicists in Medicine  
2003-present Member, Radiological Society of North America  
2006-present Member, IEEE  
2003-present Scientific Committee, Fully 3D image reconstruction in Radiology and Nuclear Medicine  
2006-present Committee member, The International Society for Optical Engineering, Medical Imaging

#### Honors

2002 Certificate of Merit, Radiological Society of North America

### B. Peer-reviewed publications (in chronological order)

(Publications selected from 133 peer-reviewed publications)

- 1 Obikawa T., **Taguchi K.**, Sasahara H., Shirakashi K., and Usui E., "Finite element analysis on discontinuous chip formation," *Journal of SPE*, Vol. 59, No. 5, May 1993, pp. 119-124.
- 2 **Taguchi K.** and Aradate H., "Algorithm for image reconstruction in multi-slice helical CT," *Medical Physics*, Vol. 25, No. 4, April 1998, pp. 550-561.
- 3 **Taguchi K.** and Anno H., "High temporal resolution for multi-slice helical computed tomography," *Medical Physics*, Vol. 27, No. 5, May 2000, pp. 861-872.
- 4 **Taguchi K.**, Miyashita S., and Ogawa Y., "New image reconstruction algorithm for increasing spatial resolution in trans-axial plane with helical CT: Principles and physical characteristics," *Journal Medical Imaging Technology*, Vol. 19, No. 3, May 2001, pp. 175-186.

- 5 **Taguchi K.**, Zeng G. L., and Gullberg G. T., "Cone-beam image reconstruction using spherical harmonics," *Physics in Medicine and Biology*, Vol. 46, No. 6, June 2001, pp. N127-N138.
- 6 **Taguchi K.**, "Temporal resolution and the evaluation of candidate algorithms for four-dimensional CT," *Medical Physics*, Vol. 30, No. 4, April 2003, pp. 640-650.
- 7 Mori I., Kazama M., Igarashi N., and **Taguchi K.**, "Method for suppressing alias artifacts in R/R-type CT," *Journal Medical Imaging Technology*, Vol. 21, No. 4, September 2003, pp. 254-264
- 8 Hein I. A., **Taguchi K.**, Silver M. D., Kazama M., and Mori I., "Cone-beam reconstruction algorithm for gantry-tilted helical multislice CT," *Medical Physics*, Vol. 30, No. 12, December 2003, pp. 3233-3242.
- 9 **Taguchi K.**, Chiang B. S., and Silver M. D., "A new weighting scheme for cone-beam helical CT to reduce the image noise," *Physics in Medicine and Biology*, Vol. 49, June 7, 2004, pp. 2351-2364.
- 10 Taguchi K., Aradate H., Saito Y., Zmora I., Han K. S., Silver M. D., "The cause of the artifact in 4-slice helical CT," *Medical Physics*, Vol. 31, July 2004, pp. 2033-2037.
- 11 Zamyatin AA<sup>#</sup>, **Taguchi K.** and Silver MD, "Helical cone beam reconstruction with asymmetrically truncated detector," *Medical Physics*, Vol. 32, October 2005, pp. 3117-3127.
- 12 **Taguchi K.**, Chiang BS, and Hein IA, "Direct cone-beam cardiac reconstruction algorithm with a cardiac banding artifact correction," *Medical Physics*, Vol. 33, February 2006, pp. 521-539.
- 13 Zamyatin AA<sup>#</sup>, **Taguchi K.** and Silver MD, "Practical hybrid convolution algorithm for CT reconstruction," *IEEE Trans. Nuclear Science*, Vol. 53, February 2006, pp. 167-174.
- 14 Katsevich A, **Taguchi K.** and Zamyatin AA, "Formulation of four Katsevich algorithms in native geometry," *IEEE Trans. Medical Imaging*, Vol, 25, July 2006, pp. 855-868.

### **U.S. patents (in chronological order)**

- 1 Taguchi K., Yamada S., and Ema T., No. 5,807,256, "Medical information processing system for supporting diagnosis (The way to display results of computer aided diagnosis (CAD))," September 15, 1998.
- 2 Taguchi K., No. 5,825,842, "X-ray computed tomographic imaging device and X-ray computed tomographic method (Generalized helical Feldkamp algorithm)," October 20, 1998.
- 3 Taguchi K. and Kobayashi T., No. 5,838,756, "Radiation computed tomography apparatus (Double centering)," November 17, 1998.
- 4 Taguchi K. and Aradate H., No. 5,974,108, "Image reconstruction apparatus (Helical filter interpolation algorithm, HFI)," October 26, 1999.
- 5 Taguchi K., No. 6,028,908, "X-ray CT scanning apparatus (Helical QQ algorithm)," February 22, 2000.
- 6 Saito Y., Ihira K., Taguchi K. Suzuki T., Miyazaki H, Muraki K. and Aradate H., No. 6,157,696, "X-ray CT scanning apparatus (Adaptive type of multi-slice CT detector array)," December 5, 2000.
- 7 Nambu K., Taguchi K. and Oishi S., No. 6,196,715, "X-ray tomo-synthesis apparatus (Volumetric imaging algorithm using digital tomo-synthesis apparatus)," March 6, 2001.
- 8 Saito Y., Aradate H., and Taguchi K., No. 6,215,843, "X-ray CT scanning apparatus (Multi-row detector with uniform sensitivity)," April 10, 2001.
- 9 Taguchi K. and Suzuki T., No. 6,415,012, "X-ray CT scanning apparatus (Gantry-tilt helical filter interpolation, T-HFI)," July 2, 2002.
- 10 Taguchi K., No. 6,584,166, "X-ray computed tomography apparatus (A method for obtaining z-coverage independent of xy-field-of-view in cone-beam CT)," June 24, 2003.
- 11 Aradate H., Saito Y. and Taguchi K., pending, "Methods for scan and reconstruction in 4D-CT," filed in October 30, 2001.
- 12 Silver M. D. and Taguchi K., pending, "X-ray computed tomography apparatus (A generalized Feldkamp helical reconstruction algorithm)," Filed in March 25, 2002.
- 13 Taguchi K., pending, "Three dimensional reconstruction algorithm for X-ray apparatus and cone-beam CT (using data reliability-based weighting scheme)," filed in October 24, 2002.
- 14 Hein I. A. and Taguchi K., pending, "Gantry tilted helical Feldkamp reconstruction algorithm," Filed on October 30, 2002.
- 15 Taguchi K. and Chiang B. S., pending, "Cone-beam helical reconstruction algorithm (using detector row-dependent weighting scheme)," filed on June 16, 2003.
- 16 Taguchi K., pending, "Radius-in-image dependent detector row filtering for windmill artifact reduction," filed on March 30, 2004.

- 17 Zamyatin A. A. and Taguchi K, pending, "Hybrid convolution algorithm for CT reconstruction," filed in October 2004.
- 18 Zamyatin A. A., Taguchi K., and M. D. Silver, pending, "Cone-beam data restoration with asymmetrically truncated data," filed in November 2004.
- 19 Taguchi K., pending, "Volumetric computed tomography system for cardiac imaging," filed on March 6, 2005.

## **B. Research support**

### **Ongoing Research Support**

0665431U (Taguchi) 7/1/06-6/30/08

American Heart Association

Compensation of the Non-Periodic Heart Motion for Cardiac CT

The goal of this research is to develop a robust corrective method to overcome the non-periodic heart motion issue for substantially reducing the artifact, thus, improving the robustness of the cardiac CT examination.

Role: PI

Siemens Research Contract (Taguchi) 3/1/07-2/29/08

Siemens Medical Solution

Banding artifact reduction in cardiac CT images using estimated motion

The goal of this research is to develop a method to reduce banding artifact in cardiac CT images.

Role: PI

Siemens Research Contract (Tsui) 7/1/07-6/30/08

Siemens Medical Solution

CT simulator

The goal of this research is to develop software to simulate CT projection data with 4D NCAT phantom

Role: Co-I

Siemens Research Contract (Tsui) 7/1/07-6/30/08

Siemens Medical Solution

Statistical reconstruction and multiple-energy in CT

The goal of this research is to develop a statistical image reconstruction method from multiple energy windows for computed tomography

Role: Co-I

### **Completed**

R01 EB001838 (Segars) 9/22/05-8/31/08

National Institute of Health

Simulation tools for dynamic CT

The goal of this research is to develop and validate accurate simulation tools for use in 3D and 4D CT imaging research. The project builds upon the existing 4D NCAT phantom and other simulation tools developed in our laboratory, which are widely used in SPECT imaging research

Role: Co-I

### **Pending Research Support**

1 R01 HL087918-01 (Taguchi) 4/1/07-3/31/11

National Institute of Health

Time resolved cardiac computed tomography with patient dose reduction

The goal of this research is to develop a method to improve the time resolution and to reduce patient dose for cardiac CT imaging. The algorithm estimates the motion of the heart and integrates it into the image reconstruction process.

Role: PI

1 R01 EB008060-01 (Taguchi)

12/1/07-11/30/10

National Institute of Health

Energy-resolved low-dose medical x-ray CT imaging using photon counting detector

The goal of this research is to develop a novel clinical CT imaging method using photon counting detectors to reduce patient dose and to improve tissue contrast.

Role: PI

1 R01 EB007600-01 (Frey)

7/1/07-6/30/10

National Institute of Health

Improved micro-CT with a novel multiple-energy-bin photon-counting detector

The goal of this research is to develop a novel micro-CT imaging method using photon counting detectors with multiple energy windows.

Role: Co-I

SBIR (Subcontract from Gamma Medica-Ideas, Inc)

9/1/07-

National Institute of Health

The goal of this research is to develop new x-ray micro-CT system with the photon counting detector to improve tissue contrast (or to reduce patient dose) and to improve the accuracy in determination of the composition and physical properties of tissues.

Role: Co-I

SBIR (Subcontract from DxRay, Inc.)

4/1/08-

National Institute of Health

The goal of this research is to develop a new photon counting x-ray detector for clinical computed tomography imaging which improves tissue contrast (or to reduce patient dose) and improves the accuracy in determination of the composition and physical properties of tissues.

Role: PI