

DAIGO TANAKA, PhD

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EDUCATION

Institution	Degree	Field of Study	Year
Carnegie Mellon Univ., PA	Ph.D.	Biomedical Engineering	2007
Keio University, Japan	M.A.	Media and Governance (*)	2000
Keio University, Japan	B.A.	Policy Management (*)	1998

* These programs contain courses of software engineering and computational geometry

RESEARCH FIELD: Software engineering, computer algorithms, computational geometry, numerical simulations, numerical optimizations, physical simulations (heat transfer), signal and image processing (ultrasound, X-ray, CT, and MRI), machine learning and pattern recognition

RESEARCH AND TEACHING EXPERIENCE IN ACADEMIA

Aug. 2002 – May 2007: PhD student at Carnegie Mellon University

- The PhD thesis research is titled “Computational Method for Cryoprobe-Layout Optimization via Finite Sphere Packing.” The research involves an optimization of the positioning heat-sink probes that freeze cancerous tumor during a surgical procedure. The techniques of 3D geometric modeling, computational geometry, numerical optimization and simulation are used.

Oct. 2000 – Jul.2002: Visiting Research Scholar at

- Computer Aided Interventions and Medical Robotics Lab, Imaging Science and Information Systems (ISIS) Center, Radiology Dept., Georgetown University (<http://www.isis.georgetown.edu>), where the applicant served as a software engineer in a team consisted with physicians and engineers for developing surgical assistance tools.
- Surgical Simulation Laboratory, National Capital Area Medical Simulation Center, Uniformed Services University of Health Sciences (<http://simcen.usuhs.mil>), where the applicant served as a research associate in a team for developing a virtual-reality surgical training system

Apr. - Aug. 2000: Part-time Lecturer in computer literacy course in the School of Media Science, Tokyo University of Technology, Japan

ACADEMIC HONORS AND ACHIEVEMENTS

- Received 1st Place in Graduate Research Presentations: 1st Annual Biomedical Engineering and Biotechnology (2006)
- Developed an automated system for planning the cryosurgery (2006)
- Developed software for the virtual reality surgical training with graphics display and force-feedback (2002)
- Developed software for the navigation system for interventional radiologists during the surgical procedure (2001)
- Developed a web-based multi-media textbook of cleft lip repair surgery (2000)
- Received Taikichiro Mori Memorial Research Development Grant (1998 and 1999)

COMPUTER SKILLS

- Computer Programming: C, C++, PHP, MySQL, Java Script, HTML, VRML, Java, MATLAB
- Graphics, Interface, Image Processing Libraries: OpenGL, Fast Light Tool Kit, Visualization Toolkit, Insight Toolkit
- Operation Systems: Microsoft Windows XP, UNIX (small scale network administrating)

LANGUAGES: English (fluent), Japanese (native fluency), Chinese (conversation), and Italian (conversation)

TEAM-WORK EXPERIENCE (NON-ACADEMIC)

- Served as a software engineer in the team for developing a computerized trial-fitting tool of eye-wear as a solution to an optician client (1999)

PERSONAL ACTIVITY

- Built an online community for coffee brewing equipments and tasting (<http://www.daigoexpressed.net/brikka>)

PUBLICATIONS

Ph.D. Thesis

- D Tanaka: Computational Method for Cryoprobe-Layout Optimization via Finite Sphere Packing. Carnegie Mellon University, May 2007

PEER-REVIEWED JOURNAL ARTICLES

1. D Tanaka, MR Rossi, K Shimada, and Y Rabin. Computerized Planning of Prostate Cryosurgery with Pullback Procedure. Computer Assisted Surgery, 2007; submitted.
2. D Tanaka, M Rossi, K Shimada, Y Rabin: Cryosurgery Planning Using Bubble Packing in 3D, Computer Methods in Biomechanics and Biomedical Engineering, in press
3. D Tanaka, M Rossi, K Shimada, Y Rabin: Towards Intra-Operative Computerized Planning of Prostate Cryosurgery, The International Journal of Medical Robotics and Computer Assisted Surgery, vol. 3(1), p. 10-9, 2007.
4. M Rossi, D Tanaka, K Shimada, Y Rabin: An Efficient Numerical Technique for Bioheat Simulations and its Application to Computerized Cryosurgery Planning Computer Methods and Programs in Biomedicine, vol. 85(1), p.41-50, 2007
5. D Tanaka, K Shimada, Y Rabin: Two-phase Computerized Planning of Cryosurgery Using Bubble-packing and Force-field Analogy, Biomechanical Engineering, vol. 128 (1), p.49-58, American Society of Mechanical Engineering, 2006
6. M Kobayashi, T Nakajima, H Chiyokura, D Tanaka, T Fujino: Network Surgical Simulation System, Journal of IEICE, vol. 84 (5), p.299-302, 2001
7. D Tanaka, M Kobayashi and H Chiyokura: The method of assisting in viewing CT image using 3 dimensional displaying function, Journal of Japan Society of Computer Assisted Surgery, vol. 6 (4), p.71-74, 1998

BOOK CHAPTER

- D Tanaka, M Kobayashi, T Fujino, T Nakajima and H Chiyokura: A Computer-Aided Cleft Lip Simulation Surgery System, Chapter 10 in Advances in Simulation and Computer-Aided Surgery, edited by T Fujino and M Kobayashi, School of Medicine, Keio University, Tokyo, 2001

CONFERENCE PROCEEDINGS

1. D. Tanaka, Kenji Shimada, Yoed Rabin: Bubble Packing Application in Computerized Planning of Cryosurgery, Medicine Meets Virtual Reality 14, Long Beach CA, January 24-27, 2006, Proceedings, p.541-543
2. F Banovac, N Glossop, D Lindisch, D Tanaka, E Levy, K Cleary: Liver Tumor Biopsy in a Respiring Phantom with the Assistance of a Novel Electromagnetic Navigation Device, Medical Image Computing and Computer-Assisted Intervention - MICCAI 2002, p.200-207.
3. K Cleary, D Tanaka, D Stewart, B Wood, M Mocanu, E Levy, F Banovac, D Lindisch, S Roderick, J Tang, H Chung: Volumetric treatment planning and image guidance for radiofrequency ablation of hepatic tumor. Proc. SPIE Vol. 529, Medical Imaging 2003: Visualization, Image-Guided Procedures, and Display. p.528-534.
4. A Liu, C Kaufmann, D Tanaka: A Simulator Architecture for Needle-based Surgical Procedures, Medical Image Computing and Computer-Assisted Intervention - MICCAI 2001: 4th International Conference Utrecht, The Netherlands, October 14-17, 2001, Proceedings, p.1137-1144
5. D Tanaka, A Liu, C Kaufmann: The Evaluation of Color Blending Functions for Texture Generation, Medical Image Computing and Computer-Assisted Intervention - MICCAI 2001: 4th International Conference Utrecht, The Netherlands, October 14-17, 2001, Proceedings, 2001, p. 1199-1200
6. D Tanaka, M Kobayashi, H Chiyokura, T Nakajima, T Fujino: XVL for Medicine: The Web-based Medical 3D Applications, Computer Assisted Radiology and Surgery, 2001, p.25-30

7. D Tanaka, M Kobayashi, H Chiyokura, T Nakajima, T Fujino: Web-based Educational Tool for Cleft Lip Repair using XVL, Medicine Meets Virtual Reality 2001 485-491 11. D Tanaka, M Kobayashi, H Chiyokura: The Simulation System for Cleft Lip Repair, Computer Assisted Radiology and Surgery, p.1029, 1999
8. M Yazawa, M Kobayashi, T Fujino, T Kaneko, D Tanaka, H Chiyokura: The interactive anatomical atlas of 3-D flaps, Computer Assisted Radiology, p.884, 1998

ORAL PRESENTATIONS

CONFERENCE PRESENTATIONS

1. D Tanaka, K Shimada, Y Rabin: Two-phase computerized planning of cryosurgery using a bubble-packing technique and force-field analogy, Cryo2005, Society for Cryobiology, July, 2005
2. K Cleary, F Banovac, E Levy, D Tanaka, S Onda, L Jiang, D Lindisch, Development of a respiratory liver motion simulator, The International Society for Optical Engineering on Medical Imaging, 2001
3. F Banovac, K Cleary, E Levy, D Lindisch, S Onda, D Tanaka: Design and Construction of a Liver Phantom for CT Imaging and Interventions that Simulates Liver Motion Seen during Respiration, Radiological Society of North America infoSYSTEM, 2001
4. M Kiyano, H Chiyokura, Y Komiya, M Wada, D Tanaka, M Kobayashi, T Nakajima, T Fujino: Distribution of Integrative Medical Images through the Internet, Japan Society of Computer Assisted Surgery, 2000
5. M Kobayashi, T Nakajima, T Kaneko, H Satoh, T Fujino, H Chiyokura, D Tanaka: The Computer Network Application in the field of Clinical cure, Researching, and Education of Plastic Surgery, Japan Society of Computer Assisted Surgery, 1999
6. D Tanaka, M Kobayashi, H Chiyokura: The 3D Modeling of Head using Human Template and Lattice Model, Japan Society of Computer Assisted Surgery, 1999

LECTURE

- D Tanaka: A Tutorial on Information Theoretic Methods in Image Analysis, Invited lecture at Medical Image Analysis course by Prof. George Stetten at University of Pittsburgh and Carnegie Mellon University, Course No. BioE 2630 (U. Pitt) 16-725 (CMU Robotics), March 2006.