Takuto Nakamura

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Career Objective

To work in a challenging research environment that would provide me with the opportunity to experience personal growth and development in my career as a researcher in Haptic and Engineering fields.

Research Interests

Augmented Reality, Haptic Display, Human-Computer Interaction, Virtual Reality.

Education

2014-present	**M.E. in Informatics**, The University of Electro-Communications, Tokyo, Japan. Advised by Associate Professor Hiroyuki Kajimoto.
2010-2014	**B.E. in Informatics**, The University of Electro-Communications, Tokyo, Japan.

Languages

English	Fluent (850 TOEIC, Feb. 2012).
Japanese	Mother tongue.

Skills

Programming Languages

C/C++, C#, Java, OpenGL, Kinect SDK, Processing.

Applications

Illustrator, Photoshop, Premiere,
MS-Word, Excel, PowerPoint,
Eagle, Max, MPLAB, R, Scilab, SolidWorks.

Projects

Major involvement in the following projects:

i. *Kinect-based Automatic Scoring System for Cervical Dystonia*

Collaborator: Natihiro Naishimura, Genko Oyama, Takashi Asahi, Mishi Sato, and Hiroyuki Kajimoto
Period: 2012-2014
Summary: Displacement and shaking of the human body are essential measures for the scoring of movement disorder. The aim of our research is to increase the accuracy and reproducibility of the scoring for spasmodic torticollis, a movement disorders that is characterized by poor head-posture. Although there are conventional scoring methods for torticollis severity, such as the Tsui Scale or TWSTRS, the results obtained are sometimes inaccurate or non-reproducible because these tests are performed manually. To capture the posture of patients' heads and bodies, we used Kinect, a three-dimensional depth sensor, and tracked their faces and bodies in real time. Using obtained data, the system automatically calculates TWSTRS without any special knowledge and training. An experiment comparing the accuracy of the system with medical specialist suggests that our system is sufficiently accurate.

ii. *Hanger-Reflex at Wrist and Waist*

Collaborator: Narihiro Nishimura, Michi Sato, and Hiroyuki Kajimoto
Period: 2013-

Summary: When a head is equipped with a hanger made of wire sideways, and its temporal region is sandwiched by the hanger, the head rotates unexpectedly. This phenomenon is called "Hanger Reflex". Although it is one of the simple methods for producing pseudo-force sensation, the position was limited to head. We discovered that a wrist or waist equipped with the bigger size device rotates the arm or the body involuntary. This fact suggests that the principle of Hanger Reflex can be applied to other parts of the body. In this paper, we report development of the device and user test, suggesting that most participants felt the rotational force. The results also suggest possible involvement of shear force to this phenomenon.

Publications

International Conference (with peer review)

1. **Takuto Nakamura,** Michi Sato, Takashi Asahi, Genko Oyama, Hiroyuki Kajimoto: Semi-automatic Scoring Method for Torticollis by Using Kinect, 17th International Congress of Parkinson's Disease and Movement Disorders, June 16-20, 2013, Sydney, Australia.

2. **Takuto Nakamura**, Narihiro Nishimura, Michi Sato, Takashi Asahi, Genko Oyama, Hiroyuki Kajimoto: Kinect-based Automatic Scoring System for Spasmodic Torticollis. IEEE 3DUI 2014, March 29-30, 2014, Minneapolis, United States.

3. **Takuto Nakamura,** Narihiro Nishimura, Michi Sato, Hiroyuki Kajimoto: Application of Hanger Reflex to wrist and waist. IEEE VR 2014, March 31-April 2, 2014, Minneapolis, United States.

4. **Takuto Nakamura**,Narihiro Nishimura, Takashi Asahi, Genko Oyama, Michi Sato, Hiroyuki Kajimoto: Kinect-based Automatic Scoring System of TWSTRS-Severity,18th International Congress of Parkinson's Disease and Movement Disorders, June 8-13, 2014, Stockholm, Sweden.