

# **The Fifth International Symposium**

## **On the Project “Computational Anatomy”**

Funded by MEXT Grant-in-Aid for Scientific Research on Innovative Areas

March 8 and 9, 2014

Takeda hall, The University of Tokyo  
Tokyo, JAPAN

### **Steering Committee**

**Chair:** Hidefumi KOBATAKE, PhD (Institute of National Colleges of Technology, Japan)

Yoshitaka MASUTANI, PhD (The Univ. of Tokyo, Japan)

Yoshinobu SATO, PhD (Osaka Univ., Japan)

Hiroshi FUJITA, PhD (Gifu Univ., Japan)

Noboru NIKI, PhD. (The Univ. of Tokushima, Japan)

Kensaku MORI, PhD (Nagoya Univ., Japan)

Akinobu SHIMIZU, PhD. (Tokyo Univ. of Agri. & Tech., Japan)

Shoji KIDO, MD, PhD (Yamaguchi Univ., Japan)

Makoto HASHIZUME, MD, PhD (Kyushu Univ., Japan)

### **Local Arrangement**

Yoshitaka MASUTANI, PhD (The Univ. of Tokyo, Japan)

### **Organizer**

Coordination Committee of the Project

“Computational Anatomy for Computer-Aided Diagnosis and Therapy

— Frontiers of Medical Image Sciences —”,

funded by MEXT Grant-in-Aid for Scientific Research on Innovative Areas



# Program

March 8, 2014

(9:30-9:40)

**Opening Remarks**

**Hidefumi Kobatake (Institute of National Colleges of Technology)**

(9:40-11:40)

**Session 1 Invited Talks**

**Session Chairs: Yoshinobu Sato (Osaka University)**

(9:40-10:40)

(IT-1) Ophthalmic 3D OCT: Relating Retinal Anatomy, Pathology, Function, and Therapy Guidance

Milan SONKA

(10:40-11:40)

(IT-2) Robotic Imaging for Patient and Process Specific, Multi-modal Intra-operative Imaging and Visualization

Nassir NAVAB

**Lunch Break (11:40 – 13:00)**

(13:00-17:20)

**Session 2 Achievements of Computational Anatomy Project**

**Session Chair: Kensaku Mori (Nagoya University)**

Computational Anatomy Models of a Human Trunk and Image understanding

Clinical Applications of Computational Anatomy Models

**Coffee Break and Demonstration**

On-site Demonstration of Foundations and Applications of Computational Anatomy

**Buffet Party (17:50-19:50)**

**March 9, 2014**

(9:00-10:36)

**Session 3 Oral Session of Planned Research Groups**

**A01: Foundations of Computational Anatomy**

**Session Chair: Shoji Kido (Yamaguchi University)**

(9:00-9:12)

(A01-1) Mathematical Foundations of Computational Anatomy: Progress Overview FY2009-2013

Yoshitaka Masutani, Hidekata Hontani, Atsushi Imiya

(9:12-9:24)

(A01-2) Fundamental Technologies for Computational Anatomy: Progress Overview FY2009-2013

Yoshinobu Sato, Masahiko Nakamoto, Yukio Tada, Takaharu Yamazaki, Noriyuki Tomiyama, Masatoshi Hori,  
Nobuhiko Sugano, Kazuomi Sugamoto

(9:24-9:36)

(A01-3) Model construction for computational anatomy: Progress Overview FY2009-2013

Hiroshi Fujita, Takeshi Hara, Xiangrong Zhou, Chisako Muramatsu, Naoki Kamiya, Min Zhang,  
Daisuke Fukuoka, Yuji Hatanaka, Tomoko Matsubara, Atsushi Teramoto, Yoshikazu Uchiyama,  
Huayue Chen, Hiroaki Hoshi

**A02: Computer Aided Diagnosis and Therapy based on Computational Anatomy**

**Session Chair: Yoshitaka Masutani (The University of Tokyo)**

(9:36-9:48)

(A02-1) Computer-Aided Diagnosis based on Computational Anatomical Models : Progress Overview  
FY2009-2013

Noboru Niki, Yoshiki Kawata, Hidenobu Suzuki, Masafumi Harada, Hideki Ohtsuka, Juniji Ueno,  
Mitsuo Shimada, Tetsuji Takayama, Masahiro Abe, Harumi Itoh, Masahiro Kaneko, Kenji Eguchi,  
Masahiko Kusumoto, Takaaki Tuchida, Hironobu Ohmatsu, Masashi Takahashi,  
Yasutaka Nakano, Hiroaki Sakai, Yuichi Takiguchi

(9:48-10:00)

(A02-2) Fusion-Aid for Diagnosis and Surgery Based on Computational Anatomy Models: Progress Overview  
FY2009-2013

Kensaku Mori, Yukitaka Nimura, Yasuhito Suenaga, Takayuki Kitasaka, Yoshito Mekada,  
Jun-ichi Hasegawa, Shigeru Nawano, Michitaka Fujiwara

10:00-10:12)

(A02-3) Computer-Aided Diagnosis of Autopsy Imaging Based on Computational Anatomy: Progress Overview  
FY2009-2013

Akinobu Shimizu, Elco Oost, Seiji Yamamoto

**A03: Clinical Application of Computational Anatomy**

**Session Chair: Akinobu Shimizu (Tokyo Univ. of Agri. & Tech.)**

(10:12-10:24)

(A03-1) Computer-Aided Diagnosis of Computational Anatomical Model and Application of Computer-Aided Autopsy Imaging : Progress Overview FY2009-2013

Shoji Kido, Rui Xu, Yasushi Hirano, Hayaru Shouno, Rie Tachibana, Nobuyuki Tanaka,  
Munemasa Okada, Naofumi Matsunaga, Hirohiko Kimura

(10:24-10:36)

(A03-2) Clinical Application of the Diagnostic and Therapeutic Model Assisted by the Computational Anatomy: Progress Overview FY2009-2013

Makoto Hashizume, Morimasa Tomikawa, Kazuo Kiguchi, Kozo Konishi, Satoshi Ieiri,  
Kenoki Ohuchida, Naoki Suzuki

**Coffee Break (10:36-11:10)**

(11:10-11:50)

**Session 4 Poster Teasers from Subscribed Research Groups**

**Session Chair: Noboru Niki (The Univ. of Tokushima)**

**Lunch Break (11:50 – 13:30)**

(13:30-15:00)

**Session 5 Poster Session of Subscribed Research Groups**

**Session Chair: Noboru Niki (The Univ. of Tokushima)**

(A01-KB1) Highly Advanced Medical Imaging Based on Computational Anatomy Model: Progress Overview FY2012-2013

Hiroyuki Kudo, Essam A. Rashed, Hirotaka Oomori, Tomoya Kodera, and Takahiro Tayama

(A01-KB2) Computer-Assisted Particle Therapy System Based on Computational Anatomy Models for Treatment Planning Mathematical Foundations of Computational Anatomy: Progress Overview FY2012-2013

Hidetaka Arimura

- (A01-KB3) Multiple-organ 3D segmentation by higher-order energy minimization: Progress Report FY2012-2013  
Hiroshi Ishikawa
- (A01-KB4) Multilinear Subspace Learning Methods for Computational Anatomical Modeling: Progress Overview  
FY2012-2013  
Yen-Wei Chen, Jie Luo, Shinya Kohara, Tomoko Tateyama, Xian-Hua Han, Akira Furukawa,  
Shuzo Kanasaki
- (A02-KB1) Development of automatic diagnosis system for age-related brain diseases using normal brain structural  
model: Progress Overview FY2012-2013  
Hiroshi Fukuda, Kazunori Sato, Yasuyuki Taki, Kai Wu
- (A02-KB2) Rebuilding a method for 4D-MRI reconstruction and modeling the motion of thoracoabdominal organs  
due to respiration: Progress Overview FY2012-2013  
Hideaki Haneishi
- (A03-KB1) Automatic Surgical Workflow Analysis Method for Navigation-guided Laparoscopic Surgery with  
Computational Anatomical Models: Progress Overview FY2012-2013  
Ryoichi Nakamura
- (A03-KB2) Development of Quantitative Diagnosis Method Based on Simulation Model of Tissue Structure  
Change: Progress Overview FY2012-2013  
Hiroyuki Hachiya, Tatsuya Higuchi, Shinnosuke Hirata,  
Tadashi Yamaguchi
- (A03-KB3) Segmentectomy simulation for early stage lung cancer using virtual 3D safety margin: Progress  
Overview FY2012-2013  
Shingo Iwano
- (A03-KB4) Navigation System with Real-time FEM Analysis for Safe and Accurate Minimally Invasive Surgery:  
Progress Overview FY2012-2013  
Kenichi Morooka

**Coffee Break (15:00-15:30)**

(15:30-16:50)

**Session 6 Panel discussion**

“Computational Anatomy: Open problems and future directions”

**Session Chairs: Makoto Hashizume (Kyushu University)  
Hiroshi Fujita (Gifu University)**

Panelists:

Karl-Heinz Hoehne (University Medical Center Hamburg-Eppendorf, Germany)  
Nicholas Ayache (INRIA, France)  
Milan Sonka (University of Iowa, USA)  
Yoshinobu Sato (Osaka Univ., Japan)  
Kensaku Mori (Nagoya Univ., Japan)  
Naoki Suzuki (The Jikei Univ. School of Medicine, Japan)

(16:50-17:15)

**Session 7 Final evaluation of the project by Advisory Committee Members**

**Session Chair: Hidefumi Kobatake (Institute of National Colleges of Technology)**

(17:15-17:20)

**Closing Remarks**

**Hidefumi Kobatake (Institute of National Colleges of Technology)**