CAOS Asia 2009
The 6th Asian Society for Computer Assisted Orthopaedic Surgery

PROGRAM & ABSTRACTS

April 3 - 4, 2009
Osaka, Japan
Welcome Message

Dear Colleagues,

On behalf of the organizing committee, it is a great pleasure for us to welcome you to the 6th CAOS Asia in Osaka, Japan. Since Prof. PS John from India founded CAOS Asia in 2004 with the support of CAOS-International to promote research and discussion on the new field of computer assisted orthopaedic surgery in Asia, the meetings have been successfully held annually (Singapore in 2005, Kaohsiung in 2006, Seoul in 2007, and Hong Kong in 2008). We founded CAOS Japan in 2007 and we are pleased that the third annual meeting of CAOS Japan is held in combination with CAOS Asia. We are confident that CAOS Asia 2009 will fulfill its aim, a rich and fruitful exchange of ideas, information about various new technologies and the formulation of future directions for CAOS.

We also hope that you enjoy Japanese beautiful season of cherry blossoms.

Nobuhiko Sugano, M.D., Ph.D.

Congress Chairman, CAOS Asia 2009
Endowed Chair Professor
Department of Orthopaedic Medical Engineering,
Osaka University Graduate School of Medicine
Organizing Committee

Iwaki, Hiroyoshi (Japan) 
Enomoto, Hiroyuki (Japan) 
Ohashi, Hirotugu (Japan) 
Kaneko, Hironori (Japan) 
Sakai, Takashi (Japan) 
Satoh, Takashi (Japan) 
Tatsumi, Ichiro (Japan) 
Tokunaga, Kunihiko (Japan) 
Nakamura, Nobuo(Japan) 
Nishii, Takashi (Japan) 
Matsubara, Masaaki (Japan) 
Miura, Hiromasa (Japan) 
Miki, Hidenobu (Japan) 
Mitani, Shigeru (Japan) 
Yanagimoto, Shigeru (Japan)

General Information

Dates: Friday, April 3 - Saturday, April 4, 2009

Venue: RIHGA Royal NCB

Address: 6-2-27 Nakanoshima, Kita-ku, Osaka 530-0005, Japan 
Phone: +81-6-6443-2251 Facsimile: +81-6-6445-2755

Congress Chairman: Nobuhiko Sugano, M.D., Ph.D. 
Endowed Chair Professor, Department of Orthopaedic Medical Engineering, Osaka University Graduate School of Medicine

Official Language: English No simultaneous interpretation will be provided.

Congress Chairman’s Office: Masaki Takao, M.D., Ph.D. 
Department of Orthopaedics, Osaka University Graduate School of Medicine

Registration Desk

The registration desk will be open during the following hours at the congress site.
Friday, April 3     8:00 – 18:00
Saturday, April 4  8:00 – 12:00

Name Badges

All participants are asked to wear their name badges throughout the Congress.

Secretariat

The congress secretariat room is located at the 2nd floor in Room KIKU.
Official Travel Agent

NIPPON TRAVEL AGENCY CO., LTD. is the official travel agent. The address is as below.
JR-West Bldg. 1F, 2-4-24 Shibata, Kita-ku Osaka 530-8341, Japan
Phone: +81-6-6376-6450 Facsimile: +81-6-6376-6465

Social Events

Welcome Reception (Banquet)
Date: Friday, April 3
Time: 18:00 – 20:00
Place: Banquet Room HANA, 3rd floor of RIHGA Royal NCB
Fee: All Researchers and Accompanying Persons are invited to the Banquet.
(Industrial Participants are required to pay 5,000 yen for the Banquet fee.)
Dress: Informal

Guidelines for Presenters

Guidelines for Presenters at Oral Sessions

Presentation Time
7 minutes for presentation and 3 minutes for discussion

PC Preview Center
Audiovisual presentations may be reviewed in the PC Preview Center.
Place: 2nd floor lobby of RIHGA Royal NCB
Date & Time: Friday, April 3 8:00 – 18:00
Saturday, April 4. 8:00 – 14:00

Please bring your data by CD-ROM, USB thumb drive or your own PC. Please prepare back up file.

Equipment for Presentation
Only Windows PC is prepared by the organizer. It will be accepted to use speaker’s own PC, too. Those who use Macintosh or the presentation data including an animation should use their own computers.

When you bring your own PC, please prepare your conversion connector.
Only Mini D-sub 15 pin connector female is prepared as RGB output.

Instruction for Presentation Data
Digital projection will be available in the meeting room, and audio visual equipments will not be available.


We strongly recommend bringing your own PC if your presentation data includes animation.

Please use standard fonts. Fonts can be a problem if nonstandard fonts are used.
Guidelines for Presenters at Poster Sessions

Presentation Time
Poster Presentation: 3 minutes for presentation and 2 minutes for discussion

Posters Session Room
Place: Room MATSU, 2nd floor of RIHGA Royal NCB
Date & Time:
- Set-up: Friday, April 3, 8:00 – 12:00
- Viewing: Friday, April 3, 12:00 – 18:00, Saturday, April 4, 8:00 – 14:00
- Sessions: Friday, April 3, 13:30 – 14:30
- Dismantle: Saturday, April 4, 14:00 – 14:30

All poster presenters will be near posters for presentation and discussion from 13:30 to 14:30 on Friday, April 3. Size of the poster board is as below. We recommend A0 size (119 cm X 84 cm) as your poster size. Be sure to include the abstract title (should be emphasized by the use of a bold type face), presenters’ name, co-authors’ names and their affiliations where the work was completed, in large letters centered at the top of the poster.

Poster No. & push-pins will be provided by the Secretariat.
### Friday, April 3

**The 6th Asian Society for Computer Assisted Orthopaedic Surgery**
(The 6th CAOS Asia)   **April 3-4, 2009**

#### Riha Royal NCB

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<tr>
<th>Time</th>
<th>Event</th>
<th>Room YODO, 2F</th>
<th>Moderator</th>
<th>Room MATSU, 2F</th>
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<td>Special Lecture I (Prof. E.K. Song)</td>
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<td>09:00</td>
<td>Session I: TKA-I: Limb Alignment &amp; Ligament Balancing (6 papers)</td>
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<td>C.Y. Yang</td>
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<td>Session II: TKA-II: Robotics &amp; Technical Innovations (5 papers)</td>
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<td>11:40-12:00</td>
<td>Presidential Guest Lecture (Prof. K.S. Leung)</td>
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<td>H. Miura</td>
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<td>14:00-14:30</td>
<td>Poster Session: THA-I</td>
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<td>H. Kaneko</td>
<td>H. Iwaki</td>
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<td>S. Mitani</td>
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<td>15:50-16:20</td>
<td>Session III: UKA (3 papers)</td>
<td>M.A. Conditt</td>
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<td>16:30-17:00</td>
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**Meeting Room:**
- Room HANA, 3F
- Room YODO, 2F
- Room MATSU, 2F
- Room KIRI, 3F

**Moderator:**
- M. Takao
- T. Sato
- C.Y. Yang
- H. Enomoto
- N. Sugano
- H. Miura
- E.K. Song
- P.S. John
- T. Tomita

**Sponsored by:**
- DePuy Companies

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**Riha Royal NCB**

**Welcome Reception (Banquet)**

**Special Lecture:**
- I. Tatsumi

**Poster Set-up & Exhibition:**

**Coffee Break:**
- 10:10-10:30

**Executive Committee Meeting (CAOS Asia):**
- 13:00-13:30

**Executive Committee Meeting (CAOS Japan):**
- 13:30-14:00

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**Room:**
- Room HANA, 3F
- Room YODO, 2F
- Room MATSU, 2F
- Room KIRI, 3F

**Session:**
- TKA-I: Limb Alignment & Ligament Balancing (6 papers)
- TKA-II: Robotics & Technical Innovations (5 papers)
- Presidential Guest Lecture (Prof. K.S. Leung)
- Luncheon Seminar I
- Poster Session: THA-I
- Poster Session: THA-II
- Workshop I: Stryker
- Workshop II: Biomet
- Workshop III: BrainLab
- Session III: UKA (3 papers)
- Session IV: HTO & Sports Medicine (4 papers)
- Evening Seminar

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**Note:**
- Oral Sessions
- Poster Sessions
- Moderator
- Meeting Room
# Saturday, April 4

**Rihga Royal NCB**

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<th>Time</th>
<th>Oral Sessions</th>
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<th>Poster Sessions</th>
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<td>Session V: THA 1-Clinical Application (7 papers)</td>
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<td>S. Yanagimoto, T. Nishi</td>
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<td>Session VI: THA 2-Coordinate Systems &amp; Technical Innovations (7 papers)</td>
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<td>M. Matsubara, K. Tokunaga</td>
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<td>Speaker Dr. J.L. Moctezuma</td>
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<td>Session VII: Trauma &amp; Tumor (4 papers)</td>
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<td>T. Murase, T. Sakai</td>
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**Moderator**

- O. Nakai
- Poster Viewing & Exhibition
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**Location**

- Room YODO, 2F
- Room MATSU, 2F

**Activities**

- Oral Sessions
- Poster Sessions
- Luncheon Seminar II
- Special Lecture III
- Award Ceremony
- Closing
08:30-08:50
Opening Ceremony
Moderator: Masaki Takao

08:50-09:10
Special Lecture I
Moderator: Takashi Sato
SL I Navigation Prediction for Balancing of Soft Tissue & Flexion-Extension GAP in Primary Total Knee Arthroplasty and It’s Mid Term Clinical Results
Eun Kyoo Song

09:10-10:10
Oral Session I: TKA-1 Limb Alignment & Ligament Balancing
Moderators: Chyun-Yu Yang
Hiroyuki Enomoto
OP01 Comparative Study between Computer-assisted Navigation and Conventional Technique in Minimally Invasive Surgery Total Knee Arthroplasty, Prospective Control Study
Thanainit Chotanaphuti
OP02 Accuracy of Image-free Navigation for Severely Deformed Knees
Minoru Takasaki
OP03 Application of the CT-based Navigation System to the Preoperative Planning and the Simulation of Positioning a Femoral Component in Minimally Invasive Total Knee Arthroplasty.
Hiroyuki Enomoto
OP04 The Limb Alignment in Conventional Total Knee Arthroplasty - Evaluation with Optical Tracking System
Chih-Wei Chang
OP05 Ligament Balance for Varus Knee in Computer Navigation Total Knee Replacement
Peter Wai Pan Yau
OP06 Bone Cutting and Ligament Balancing in CAS Revision Total Knee Arthroplasty
Dae K Bae

10:10-10:30
Coffee Break

10:30-10:50
Special Lecture II
Moderator: Tetsuya Tomita
SL II Computer and Tissue Sparing Surgery in Knee Replacement
Norberto Confalonieri

10:50-11:40
Oral Session II: TKA-2 Robotics & Technical Innovations
Moderators: Dae K Bae
Tetsuya Tomita
OP07 A Novel Technique to Control Femoral Component Alignment by Instrument-related 3D Preoperative Planning System for Total Knee Arthroplasty
Takashi Sato
OP08 Limb Alignment and Position of the Components in Bilateral Total Knee Replacement with Robotic and Conventionally Manual Support (A Prospective, Randomized Study)
Sang Jin Park
OP09 A New Design of Robot Assisted Planar Bone Resection for Total Knee Replacement
Shuo-Suei Hung
OP10  Knee Range of Motion depending on the Different Femoral Component Design
       - In Vivo Evaluation Using Navigation -
       Dam Seon Lee

OP11  Development of a Robot System for Less Invasive Arthroplasty
       Kazuo Fujiwara

11:40-12:00
Presidential Guest Lecture
Moderator: Nobuhiko Sugano
The Significance of CAOS in Asia
Kwok Sui Leung

12:00-13:00
Luncheon Seminar I (Sponsored by Japan Medical Materials Corporation)
Moderator: Hiromasa Miura
Preoperative TKA Planning with a CT-based Simulation Software “The 3D-Template”: How Do We Get the 3D Information Preoperatively and Use It Intraoperatively?
Masao Akagi

13:00-13:10
Invitation to CAOS Asia 2010 in Thailand
Moderator: Masaki Takao
Speaker: Thanainit Chotanaphuti

13:00-13:30
CAOS Asia Executive Committee Meeting (Room KIRI, 3F)

13:30-14:30
Poster Sessions (Room MATSU, 2F) see Page 11

14:30-15:00
CAOS Japan Executive Committee Meeting (Room KIRI, 3F)

14:30-14:50
Workshop 1: Demonstration of Knee Navigation (Room MATSU, 2F)
Jose Luis Moctezuma de la Barrera (Stryker Instruments)

14:50-15:10
Workshop 2: Signature Knee Guide “Patient-specific Approach in Total Knee Arthroplasty” (Room MATSU, 2F)
Yukari Kito (BIOMET JAPAN, INC.)

15:10-15:30
Workshop 3: The Unlimited Solution - The Latest Navigation Application for Computer Assisted Knee Arthroplasty (Room MATSU, 2F)
Graetz Roland (Brain LAB AG)
Shimomura Keita (Brain LAB KK)

15:30-15:50
Coffee Break

15:50-16:20
Oral Session III: UKA
Moderators: Michael A Conditt
Ichiro Tatsumi
OP12  Tibial Undercutting in a Navigation System Designed for Unicompartmental Knee Arthroplasty  
Paul S Cullis

OP13  Robotically Assisted UKA is More Accurate than Manually Instrumented UKA  
Michael A Conditt

OP14  Clinical Evaluation of “Direct Tunneling Technology” in UKA  
Chun Tek Lee

16:20-17:00

Oral Session IV: HTO & Sports Medicine
Moderators: Eun Kyoo Song  
P.S. John

OP15  Preoperative Simulation of Graft attachment Sites for Knee Ligament Reconstruction toward Clinical Application  
Yuki Ueyama

OP16  Selective Bundle Augmentation for Isolated Bundle Injury of ACL using Navigation  
Nam Young Cho

OP17  Comparison In Vivo Isometricities for the Navigation assisted and Conventional Anterior Cruciate Ligament Reconstruction Techniques  
Eun Kyoo Song

OP18  Development of the Program for Assessment of the Grounding Point on the Behind Foot  
Hideo Kawakami

17:00-18:00

Evening Seminar (Sponsored by DePuy Companies)
Moderator: Tetsuya Tomita

Benefits of CT-Free Navigation wiht Primary & Revision TKA  
Arun B. Mullaji

18:00-20:00

Welcome Reception (Room HANA, 3F)
Friday, April 3, 2009  Poster Sessions (Room MATSU, 2F)

**Group A**

13:30-14:00

**Poster Session: THA 1**
Moderator: Hironori Kaneko

PP01  The Accuracy of Spatial Position of the Cup Using CT-based Navigation System in Total Hip Arthroplasty  
Daiki Iwana

PP02  Accuracy Evaluation of Placement of Acetabular Compoment using Fluoro-CT Matching CT-based Navigation and Landmark Matching CT-based Navigation and Free Hand Techniques in MIS-THA -Prospective Randomized Study-  
Shoichi Nishikino

PP03  ODUNU-the Optical 2D-3D-Matching CT-based Navigation System for Total Hip Arthroplasty-  
Mitsuhiko Ikebuchi

PP04  Computer Tomography Based Navigation Assisted Total Hip Arthroplasty in Patient with Severe Bone Loss in Posterior Acetabular Wall after Rotational Acetabular Osteotomy  
Hidetoshi Hamada

PP05  Use of Navigation Improves Precision of Cup Placement in Cemented THA done for Severe Dysplasia  
Hirosuke Endo

14:00-14:30

**Poster Session: THA2**
Moderator: Shigeru Mitani

PP06  The Effects of a CT-based Navigation System on Orientation of Prosthesis in Total Hip Arthroplasty  
Hidenobu Miki

PP07  A Comparison Between Robotic-assisted and Manual Implantation of Primary Cementless Total Hip Arthroplasty Femoral Components; Minimum Five Years Results  
Nobuo Nakamura

PP08  Evaluation of Acetabular Component Position by using Fluoro-based Navigation System in RevisionTHA -Examination from Installation Location and Angle-  
Tesshu Ikawa

PP09  CT-based Preoperative Planning in Cementless Acetabular Revision  
Keiji Haraguchi

PP10  Five-year Follow-up Assessment of the Pelvic Flexion Angle after Total Hip Arthroplasty  
Shunsaku Nishihara

**Group B**

13:30-14:00

**Poster Session: TKA**
Moderator: Hiroyoshi Iwaki

PP11  Minimally Invasive Computer-assisted Total Knee Arthroplasty Versus Minimally Invasive Jig-based Technique  
Masahiro Hasegawa

PP12  Does the Imageless Navigation-Assisted Total Knee Arthroplasty have a Pitfall in Anatomic Variations around Knee ?  
Kwang-Jun Oh

PP13  Accuracy of Implant Position in MIS TKA -The role of Navigation-  
Masakazu Fujii

PP14  Radiological Results of Total Knee Arthroplasty with a CT-based Computer-assisted Navigation System  
Takaaki Shibuya

PP15  3D Kinematic Analysis of Mobile-bearing Total Knee Arthroplasty using X-ray Fluoroscopy  
Takaharu Yamazaki

14:00-14:30

**Poster Session: THA3**
Moderator: Hirotsugu Ohashi

PP16  Dynamic Pelvic Flexion Angle after THA among Patients with Pelvic Reclination  
Kosuke Tsuda
PP17  Comparison of Bony and Prosthetic ROM in Simulation  Ichiro Nakahara
PP18  Atlas-based Automated Size Selection and Positioning of Acetabular Cup for THA  Kazuto Kobayashi
PP19  Easy Simulation Method of Transtrochanteric Rotational Osteotomy for Femoral Head Osteonecrosis using Multi-Planar Reconstruction of MR Images  Tsuyoshi Koyama
PP20  The Influence of Chemical Shift Artifacts on Cartilage T2 Mapping  Toshiyuki Shiomi
PP21  Predictability of Preoperative Planning in Total Hip Arthroplasty using 2D Digital Planning Software  Kentaro Yabuta
Saturday, April 4, 2009  Oral Sessions (Room YODO, 2F)

08:00-09:00
Morning Seminar (Sponsored by TOYO Medic Co., Ltd.)
Moderator: Osamu Nakai
Clinical Experiences Using The Latest 3D C-Arm with Flat Panel Detector in Spinal Surgery.  
Makoto Nishiyama

09:00-10:10
Oral Session V: THA-1 Clinical Application
Moderators: Shigeru Yanagimoto
Takashi Nishii
OP19 CT-fluoro Matching Procedure Improves the Registration in CT-based Navigation THA
Kunihiko Tokunaga
OP20 Evaluation of the Accuracy in Newly Developed CT-based Fluoroscopy Matching Total Hip Navigation System. -Comparison between New System and Land-mark Matching System- 
Shigeru Yanagimoto
Hironori Kaneko
OP22 The Accuracy of Accetabular Cup Replacement with CT-based Navigation
Yuki Maeda
OP23 Individual Variability for the Registration in Image-free Navigation System for THA -Comparison between Lateral Decubitus Position and Supine Position-
Masanori Matsuura
OP24 Surgical Guide Based on Rapid Prototyping Technique for Cup Insertion in Total Hip Arthroplasty
Takehito Hananouchi
OP25 Clinical Application of CT-based Navigation System for Hip Resurfacing Arthroplasty
Makoto Kitada

10:30-11:40
Oral Session VI: THA-2 Coordinate Systems & Technical Innovations
Moderators: Masaaki Matsubara
Kunihiko Tokunaga
OP26 The Methods of Measuring Leg length Discrepancy -Are conventional methods accurate for severe orthoarthritis patients?- Naoyuki Hirasawa
OP27 Comparison of Pelvic Coordinate Systems using 3D-CT
Masaki Takao
OP28 In Vivo Three-Dimensional Analysis of Passive Hip Flexion after Total Hip Arthroplasty Using X-ray Fluoroscopy
Junichiro Koyanagi
OP29 Evaluation of Bearing Failures in Patients with Total Hip Arthroplasty Using High-resolutional Isotropic CT
Takashi Nishii
OP30 AutolmPlan: An Automated System for CT -based THA Planning -Planning Optimization based on Anatomical Compatibility and Jointfunction- 
Itaru Otomaru
OP31 AutolmPlan: An Automated System for CT-based THA Planning -Atlas-based Segmentation and Anatomical Feature Localization from 3D CT Images
Futoshi Yokota
OP32 Cement Removal from the Femur using the ROBODOC System in Revision Total Hip Arthroplasty
Mitsuyoshi Yamamura

11:40-12:00
Special Lecture III
Moderator: Nobuhiko Sugano
SL III Computer-assisted spine surgery
Sohei Ebara
12:00-13:00
Luncheon Seminar II
Moderator: Nobuo Nakamura
The Future of Surgical Navigation, A Technological Journey
Jose Luis Moctezuma de la Barrera

13:00-13:40
Oral Session VII: Trauma&Tumor
Moderators: Tsuyoshi Murase
Takashi Sakai

OP33 Distal Locking Made Easy - Done with a New Navigation Technique with Minimal Radiological Exposure
Kwok Sui Leung

OP34 Three-dimensional Corrective Osteotomy of Malunited Fractures of the Upper Extremity Using a Novel Computer Simulation System and a Custom-Designed Surgical Template.
Tsuyoshi Murase

OP35 Can CT-fluoro Matching be Used in Pelvic Bone Registration for CAOS?
Eric WK Ng

OP36 Computer-Assisted Tumor Surgery (CATS): An Extended Application in CAOS
KC Wong

13:40-13:50
Award Ceremony
Moderator: Masaki Takao