

Hong Kong, China, June 4-7, 2008

# Computer Assisted Orthopaedic Surgery

8<sup>th</sup> Annual Meeting of  
CAOS-International  
Final Program

5<sup>th</sup> Annual Meeting  
of CAOS-Asia  
Final Program



8<sup>th</sup> Annual Meeting  
of the International Society  
for Computer Assisted  
Orthopaedic Surgery

5<sup>th</sup> Annual Meeting of the  
Asian Society  
for Computer Assisted  
Orthopaedic Surgery

Hong Kong  
June 4-7, 2008

**5<sup>th</sup> Annual Meeting of the Asian Society for Computer Assisted  
Orthopaedic Surgery**

**Instructional lectures**

**Moderators: PS John, KY Yang**

- 8:00 History and development of CAOS  
*LP Nolte*
- Principles of imageless CAOS  
*Leo Joskowicz*
- Principles of image-guided CAOS  
*F Langlotz*
- Principles of robotic assisted surgery  
*BL Davies*
- Applications in arthroplasty  
*JY Jenny*
- Applications in trauma surgery  
*KS Leung*
- Application in spinal surgery  
*W Tian*
- Future developments  
*JL Moctezuma*
- 10:00 BREAK
- 10:30 HANDS-ON WORKSHOPS – FIVE WORKSHOPS WILL BE PRESENTED IN PARALLEL, EACH OF THEM FIVE TIMES. PARTICIPANTS ARE FREE TO CHOOSE THEIR INDIVIDUAL SEQUENCE OF WORKSHOP ATTENDANCE.
- Workshop 1 (Room 1)  
*Sponsored by BrainLAB*
- Workshop 2 (Room 2)  
*Sponsored by Stryker*
- Workshop 3 (Room 3)  
*Sponsored by BrainLAB*
- Workshop 4 (Lecture Hall)  
*Sponsored by DePuy*
- Workshop 5 (Theater 2)  
*Sponsored by Materialise*
- 12:30 LUNCH AND LIFE-SURGERY FROM PRINCE OF WALES HOSPITAL
- 14:30 Welcome Speech  
*EK Song, President of CAOS-Asia*
- 14:40 CAOS-research in Korea  
*EK Song*

**Free papers I****Moderators: N Tang, KC Wong**

- 15:00 Navigation with fused pre-operative CT/MRI and intra-operative 3D fluoroscopy – Introduction to a new navigation technique and the clinical applications  
*N Tang, KS Lee, Eric WK Ng, KS Leung*
- A Fluoroscopy-guided Robotic System for ACL Reconstruction  
*Y Hu, JC Wang, TM Wang, L Sun, WY Liu, YW Wang, H Feng, MY Wang*
- Navigation in scaphoid screw fixation: A cadaveric model  
*WL Tse, VHY Wong, LMY Siu, TWK Lau, EWK Ng, PC Ho, LK Hung*
- 3D CT based computer assisted navigation for insertion of cervical pedicle screws  
*RCL Yip, KY Fung, KO Kwok, SW Law*
- Computer assisted navigation as applied to the thoracic and lumbar spine  
*RCL Yip, KY Fung, KO Kwok, SW Law*
- Pelvic-acetabulum anatomical study with high resolution CT and 3D navigation planner – feasibility and safety margin study for percutaneous sacral-iliac screws and column screws  
*N Tang, KS Lee, Eric WK Ng, KS Leung*
- Computer assisted precision tumour resection of pelvic bone tumour  
*YL Lam, KL Mak, TYC So*
- How does computer assisted tumor surgery (CATS) affect computer aided design/computer aided modeling (CAD/CAM) in tumor prostheses? A preliminary report  
*KC Wong, SM Kumta, EKW Ng, KS Lee, P Unwin, LF Tse*
- 16:10 BREAK
- 16:30 CAOS-research in Japan  
*N Sugano*

**Free papers II****Moderators: KW Cheung, WP Yau**

- 16:50 Electromagnetic navigation in total knee arthroplasty  
*KW Cheung, KH Chiu, CY Tso*
- Sagittal plane alignment of the femoral component in total knee arthroplasty – CAOS vs. manual  
*EK Song, JK Seon, SJ Park, YJ Kim, CI Hur*
- Validation of tibial component rotational alignment in navigation assisted total knee arthroplasty  
*HC Lim, JH Bae, SH Han, HS Jung*
- What have I learn after adopting computer navigation in total knee replacement?  
*WP Yau, KY Chiu, CH Yan, WM Tang, TP Ng*
- Comparative clinical outcome of computer assisted total knee arthroplasty with/without minimally invasive surgery  
*C Leelasestaporn*
- Limb alignment and position of the components in bilateral total knee replacement with robotic and conventionally manual support (a prospective, randomized study)  
*EK Song, JK Seon, SJ Park, YJ Kim, CI Hur*
- CT-Based navigation to determine the socket location in an osteoarthritis hip with a large leg length discrepancy due to severe acetabular dysplasia  
*S Jingushi, H Mizu-uchi, Y Iwamoto*
- 18:00 END OF MEETING
- 18:30 JOINT WELCOME RECEPTION OF CAOS-INTERNATIONAL AND CAOS-ASIA AT THE INDUSTRIAL EXHIBITION

## ***Conference Chairman***

**Kwok-Sui Leung, M.D.**

Department of Orthopaedics and Traumatology, The Chinese University of Hong Kong

## ***Program Committee***

**Brian L. Davies, Ph.D. (Chairman)**

London, Great Britain

**Florian Gebhard, M.D.**

Ulm, Germany

**Branislav Jaramaz, Ph.D.**

Pittsburgh, USA

**Leo Joskowicz, Ph.D.**

Jerusalem, Israel

**Philippe Merloz, M.D.**

Grenoble, France

**Klaus Radermacher, Ph.D.**

Aachen, Germany

**Norberto Confalonieri, M.D.**

Milano, Italy

**Antony Hodgson, Ph.D.**

Vancouver, Canada

**P.S. John, M.D.**

Kottayam, India

**Martin Krismer, M.D.**

Innsbruck, Austria

**Lutz-P. Nolte, Ph.D.**

Bern, Switzerland

**Michael L. Swank, M.D.**

Cincinnati, USA

## ***CME Credits***

The Hong Kong College of Orthopaedic Surgeons has awarded the following education and training credits to the 8<sup>th</sup> Annual Meeting of CAOS-International and the 5<sup>th</sup> Annual Meeting of CAOS-Asia, respectively:

8<sup>th</sup> Annual Meeting of CAOS-International ..... 10 Cat. A CME/CPD points (for Fellows)  
10 Training points (for Trainees)

5<sup>th</sup> Annual Meeting of CAOS-Asia ..... 5 Cat. A CME/CPD points (for Fellows)  
5 Training points (for Trainees)

## ***For Information and Registration Please Contact***

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URL <http://www.CAOS-International.org/2008/>

## ***Wednesday, June 4, 2008***

14:00 Registration

18:30 JOINT WELCOME RECEPTION OF CAOS-INTERNATIONAL AND CAOS-ASIA AT THE INDUSTRIAL EXHIBITION

## Thursday, June 5, 2008

- 7:00 REGISTRATION  
 7:45 Welcome and introduction  
*KS Leung, BL Davies*

### Session I – Total Knee Replacement – Part I: Outcome Studies

**Chairmen: Brian L. Davies and Eun Kyoo Song**

- 8:00 Surgical technique and early results after minimally invasive versus conventional OrthoPilot®-navigated Columbus® total knee arthroplasty  
*F Lampe, K Bohlen*
- 8:07 Initial outcome of 100 navigated TKA compared to 100 controls: An American experience  
*AP Mok, L Josephs, JM Siliski*
- 8:14 Computer-assisted versus manual TKA: A long-term follow-up of clinical and functional outcomes  
*SD Stulberg, MA Yaffe, SE Gall Sims*
- 8:21 DISCUSSION
- 8:30 A five-years experience with OrthoPilot navigated Columbus total knee replacement  
*S Hakki*
- 8:37 Using gait analysis to compare functional outcome measures following total knee replacement performed with navigation or standard instrumentation techniques  
*JM Dillon, JV Clarke, AC Nicol, F Picard, A Gregori, A Kinninmonth*
- 8:44 The learning curve with computer assisted total knee arthroplasty: A novice compared to an experienced navigator  
*J Baines, AH Deakin, F Picard*
- 8:51 DISCUSSION
- 9:00 The mathematical relationship between valgus deformity and tourniquet time in navigated total knee arthroplasty  
*SAC Sampath, SH Voon, M Sangster, HG Davies*
- 9:07 Detailed analysis of operating time in CAS and manual TKA interventions – Preliminary study  
*S Bignozzi, L Nofrini, MP Neri, M Lo Presti, M Marcacci*
- 9:14 Navigated revision total knee replacement  
*JY Jenny, C Boeri, Y Diesinger, E Ciobanu*
- 9:21 DISCUSSION

### Session II – Unicompartmental Knee Replacement

**Chairmen: Martin Krismer and Kuang-Ying Yang**

- 9:30 Navigated shorter incision or smaller implant in knee arthritis?  
*N Confalonieri, A Manzotti, K Motavalli, F Montironi*
- 9:37 Navigated minimal invasive unicompartmental knee replacement  
*JY Jenny, Y Diesinger, C Boeri, E Ciobanu*
- 9:44 Minimal invasive robot assisted unicompartmental knee arthroplasty  
*A Pearle, P O'Loughlin, C Lippincott, D Kendoff*
- 9:51 DISCUSSION

**Coffee Break and Poster Session, Part 1**

- 10:00 POSTERS WILL BE PRESENTED IN TWO SESSIONS, DURING WHICH THE AUTHORS WILL BE PRESENT AT THE POSTER BOOTHS. HOWEVER, ALL POSTERS OF BOTH SESSIONS WILL BE ON DISPLAY DURING THE ENTIRE TIME OF THE MEETING.
- 1) A fluoroscopically based navigation system for ACL replacement surgery: Development, precision analysis, and comparison of 2D planed positions with their navigated 3D counterparts  
*VR Hofbauer, B Koenig, A Ruebberdt, NP Haas, MJ Raschke, U Stoeckle*
  - 2) Measuring the position of the ACL footprint with a navigation system. Comparison with X-ray, CT-scan and anatomic measurements  
*JY Jenny, E Ciobanu, C Boeri*
  - 3) Navigation accuracy analysis of ACL reconstruction with two tracking modes  
*L Sun, Y Hu, JC Wang, H Feng, WY Liu, YW Wang, MY Wang, TM Wang*
  - 4) In-vivo investigation of lumbar spinal instability using an instrumented spinal distractor  
*S Ambrosetti, A Pfenniger, M Krenn, W Piotrowski, P Büchler, J Kowal, LP Nolte, J Burger*
  - 5) Application and valence of the 3D-C-arm in the cervical and upper thoracic spine  
*JS Jarvers, S Katscher, A Franck, HJ Riesner, T Blattert, H Siekmann, C Josten*
  - 6) In-vivo measurements of the bending stiffness of the scoliotic spine  
*C Reutlinger, J Kowal, J Burger, C Hasler, P Büchler*
  - 7) Accuracy in navigated total hip replacement with and without invasive femur locator  
*MD Hoffart, W Moser*
  - 8) Acetabular cup orientation using a statistical data based calibration table  
*X Dong, S Echeverri, LP Nolte, J Vallotton, G Zheng*
  - 9) Assessment of accuracy of acetabular cup orientation in CT-free navigated total hip arthroplasty  
*S Fukunishi, T Fukui, S Nishio, S Yoshiya*
  - 10) Acetabular center axis: A novel alternative to anterior pelvic plane  
*S Hakki*
  - 11) Antero-lateral subgluteal mini-invasive navigated hip replacement  
*S Hakki*
  - 12) Intraoperative soft tissue tension in total hip arthroplasty using CT-based navigation system  
*T Hananouchi, T Nishii, T Sakai, M Takao, K Tsuda, H Yoshikawa, N Sugano*
  - 13) Cup and stem navigation in THA with only one pelvic tracker – Technique and preliminary results  
*H Kiefer, U Schmerwitz*
  - 14) Evaluation of the clinical accuracy of a CT-based navigation for femoral stem orientation and leg length discrepancy  
*M Kitada, N Nakamura, N Sugano, A Kakimoto, D Iwana, T Nishii, H Miki*
  - 15) Possible registration error for the anterior pelvic plane and its effect on inclination and anteversion calculation in navigated THR – A Sawbone study  
*T Mattes, R Decking, O Ostertag, H Reichel*
  - 16) Accuracy of the cup orientation with minimally invasive total hip arthroplasty compared to conventional total hip arthroplasty using CT-free navigation system  
*S Nishio, S Fukunishi, T Fukui, S Yoshiya*
  - 17) Leg length and offset measurements in imageless stem navigation during total hip arthroplasty – An experimental cadaver study  
*T Renkawitz, E Sendtner, J Grifka, T Kalteis*
  - 18) Preoperative planning for total hip arthroplasty with CT based surgical planning system  
*MD Takamatsu, PHD Satoh*
  - 19) Are there inert radiographic parameters on AP pelvic radiographs? A computer-assisted study  
*M Tannast, S Mistry, SD Steppacher, KA Siebenrock, G Zheng*
  - 20) Combined native hip motions strongly demonstrate the need for navigation in total hip arthroplasty  
*RL Thornberry, LS Nelson*

ACL

Spine

Total Hip Replacement

- 21) Does CT-fluoro matching procedure improve registration accuracy in navigation THA?  
*K Tokunaga, K Watanabe, K Imai, M Muraoka*
- 22) Accuracy of new CT-based fluoroscopy-matching hip navigation system  
*S Yanagimoto, H Kaneko, Y Hujita, A Funayama, Y Suda, H Enomoto, Y Niki, Y Toyama*
- 23) Precise estimation of post-operative cup alignment from single standard X-ray radiograph  
*G Zheng, X Zhang, S Steppacher, M Tannast*
- 24) Application of CT-based navigation for revision THA and THA for hip with metal implants  
*N Nakamura, N Sugano, T Nishii, A Kakimoto, D Iwana, M Kitada, M Yamamura*
- 25) Navigation versus radiographic measurements in the open-wedge and closed-wedge high tibial osteotomy Using computer assisted surgery (CAS)  
*DK Bae, SJ Song, JH Noh, WS Chang, KY Jung*
- 26) Analysis of the effect of the laterally elevated wedged insole and high tibial osteotomy to the patient with medial compartment OA of the varus knee using 4D gait analysis system  
*H Kawakami, N Sugano, K Yonenobu, H Yoshikawa, A Hattori, N Suzuki*
- 27) Impact in the treatment of calcaneal fractures by 3D-fluoroscopy  
*S Maegerlein, A Unger, C Queitsch, C Juergens, AP Schulz*
- 28) Autonomous robotic drill-assistance for femoral intramedullary nailing  
*M Oszwald, R Westphal, M Citak, D Kendoff, T Hüfner, FM Wahl, C Krettek, T Gosling*
- 29) 3D navigated placement of screws in the sustentaculum tali as a treatment of intraarticular calcaneal fractures  
*A Ruebberdt, VR Hofbauer, MJ Raschke*
- 30) Ergonomic evaluation methods on computer aided surgery – Preliminary design  
*L Anselmi, M Canina, P Cerveri, N Lopomo, M Marcacci*
- 31) Cooperative robotic assistant surgery system  
*RA Castillo-Cruces, J Wahrburg*
- 32) Computer assisted navigation of fine instruments: Technical approach and initial testing  
*M Citak, D Kendoff, P O'Loughlin, P Bretin, M Krettek, T Hüfner*
- 33) Technical evaluation of the positional accuracy of computer assisted surgical systems  
*JV Clarke, AH Deakin, F Picard, AC Nicol*
- 34) Evaluation of the efficiency of the zero-dose C-arm navigation approach  
*M de la Fuente, P Belei, M Müller, T Mumme, K Radermacher*
- 35) Accuracy of center of femoral head and talocrural joint calculated by navigation system  
*H Enomoto, K Matsuzaki, H Matsumoto, T Otani, Y Niki, Y Suda*
- 36) ORMIS: A miniature orthopaedic robot with registration from two C-frame images  
*PA Finlay, S Morfey, W Dandachli, A Amis*
- 37) Smart device: Virtually extended surgical drill  
*SM Heining, C Bichlmeier, E Euler, N Navab*
- 38) A fluoroscopy-guided robotic system for ACL reconstruction  
*Y Hu, TM Wang, JC Wang, L Sun, WY Liu, YW Wang, H Feng, MY Wang*
- 39) In-vitro robot assisted bone resection for total knee arthroplasty. An orthopedic surgeon's experience  
*TSS Hung, PL Yen, MY Lee*
- 40) Computer assisted surgery (CAS) in orthopaedic oncology  
*PC Jutte, SB Bulstra*
- 41) Automated 2D/3D image matching method with dual X-ray images to estimate 3D in-vivo knee kinematics  
*YH Kim, DP Le, K Kim, WM Park*
- 42) Time and cost savings with navigated total knee replacement  
*G Kirsh*

THR

Trauma &amp; Osteotomies

Technical Innovations &amp; New Applications

**Session III – Technical Innovations**

**Chairmen: Antony Hodgson and André Bauer**

- 11:00 Does medio-lateral motion occur in normal and cruciate-retaining and posterior-stabilized replaced knees?  
*C Belvedere, A Leardini, A Ensini, A Feliciangeli, L Bianchi, F Catani, S Giannini*
- 11:07 Defining the ideal patellar resection plane  
*C Anglin, C Fu, AJ Hodgson, N Helmy, NV Greidanus, BA Masri*
- 11:14 DISCUSSION
- 11:20 Assessment of anatomical criteria across populations using statistical shape models and level sets  
*N Kozic, M Reyes, M Tannast, LP Nolte, MÁ González Ballester*
- 11:27 CT-3D fluoroscopy image fusion as a non-invasive registration method for pelvic trauma surgery: An in-vitro evaluation  
*T Rudolph, M Citak, T Hüfner, J Kowal*
- 11:34 PET-CT-fluoro-matching on long bones? – First experiences  
*M Militz, S Hungerer, A Haug*
- 11:41 DISCUSSION

**Presidential Guest Lecture 1**

- 11:50 Dr. York YN Chow, SBS, JP  
*Secretary for Food and Health  
Government of the Hong Kong Special Administrative Region*

**Lunch Break and Live Surgery**

- 12:20 LUNCH BREAK AT THE INDUSTRIAL EXHIBITION WITH LIVE SURGERY TRANSMISSION

**Session IV – Trauma and Osteotomy**

**Chairmen: Patrick Finlay and Tian Wei**

- 14:00 A prospective study on navigated high tibial osteotomy  
*F Gebhard, P Keppeler, AB Imhoff, U Stöckle, PA Grützner, T Hüfner, J Ljungqvist, C Krettek*
- 14:07 Open wedge tibial osteotomies – Influence on axial rotation and tibial slope  
*D Kendoff, D Lo, P Goleski, B Warkentine, P O'Loughlin, A Pearle*
- 14:14 Closing wedge proximal tibial osteotomy using navigation system  
*DK Bae, SJ Song, JH Noh, WS Chang, JH Eo*
- 14:21 DISCUSSION
- 14:30 Navigated rotational acetabular spherical osteotomy  
*N Sugano, T Nishii, T Sakai, M Takao, T Hananouchi, T Koyama, Y Sato, N Nakamura*
- 14:37 Computer-assisted detection of radiographic parameters predicting poor long-term outcome of Bernese periacetabular osteotomy  
*SD Steppacher, M Tannast, G Zheng, R Ganz, KA Siebenrock*
- 14:44 Intraoperative biomechanical simulation of the outcome of corrective osteotomies – A method for defining correction parameters  
*P Belei, C Saglamer, T Mumme, K Radermacher*
- 14:51 DISCUSSION

**Panel Discussion 1 – Uncertainty in CAOS: Why am I always right?**

**Moderator: Leo Joskowicz**

15:00 Panelists: Justin Cobb, Philippe Merloz, Antony Hodgson

**Break**

15:30 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

**Session V – Total Hip Arthroplasty – Part 1: Leg Length Discrepancy and Coordinate Systems**

**Chairmen: Philippe Merloz and Branislav Jaramaz**

- 16:00 Leg length discrepancy in total hip replacement: Stem and cup navigated technique versus conventional  
*A Manzotti, N Confalonieri, K Motavalli, F Montironi*
- 16:07 Computer-assisted intraoperative measurement of leg length in total hip arthroplasty: An accurate and simple method  
*TM Ecker, SD Steppacher, M Haimerl, SB Murphy*
- 16:14 Pinless array fixation in determining leg length in imageless navigation  
*V Perumal, ML Swank*
- 16:21 DISCUSSION
- 16:30 Relationship between the accuracy and the thickness of CT slice using CT based navigation system – Is 1mm sliced CT needed for navigation THA?  
*H Naoyuki, M Masaaki, I Kenshi, H Shinji, O Naoki*
- 16:37 Ultrasound based localization of pelvic anatomical coordinate system  
*P Foroughi, DY Song, RH Taylor, G Fichtinger*
- 16:44 Automatic determination of anterior pelvic plane for navigated THA using 3D freehand ultrasound  
*MT Hirschmann, C Helfrich, T Schwägli, HM Overhoff, NF Friederich*
- 16:51 DISCUSSION

**Educational Workshops, 1<sup>st</sup> Iteration**

17:00 FOUR WORKSHOPS WILL BE PRESENTED IN PARALLEL, EACH OF THEM TWICE. THIS SCHEME WILL BE REPEATED DURING THE 2<sup>ND</sup> ITERATION. PARTICIPANTS WILL BE ASSIGNED TO FOUR DIFFERENT GROUPS AND WILL BE GUIDED THROUGH THE WORKSHOPS. EVERY PARTICIPANT WILL ATTEND EACH WORKSHOP ONCE THROUGHOUT THE TWO ITERATIONS.

Workshop 1 (Room 1)  
*Sponsored by BrainLAB*

Workshop 2 (Room 2)  
*Sponsored by Stryker*

Workshop 3 (Room 3)  
*Sponsored by BrainLAB*

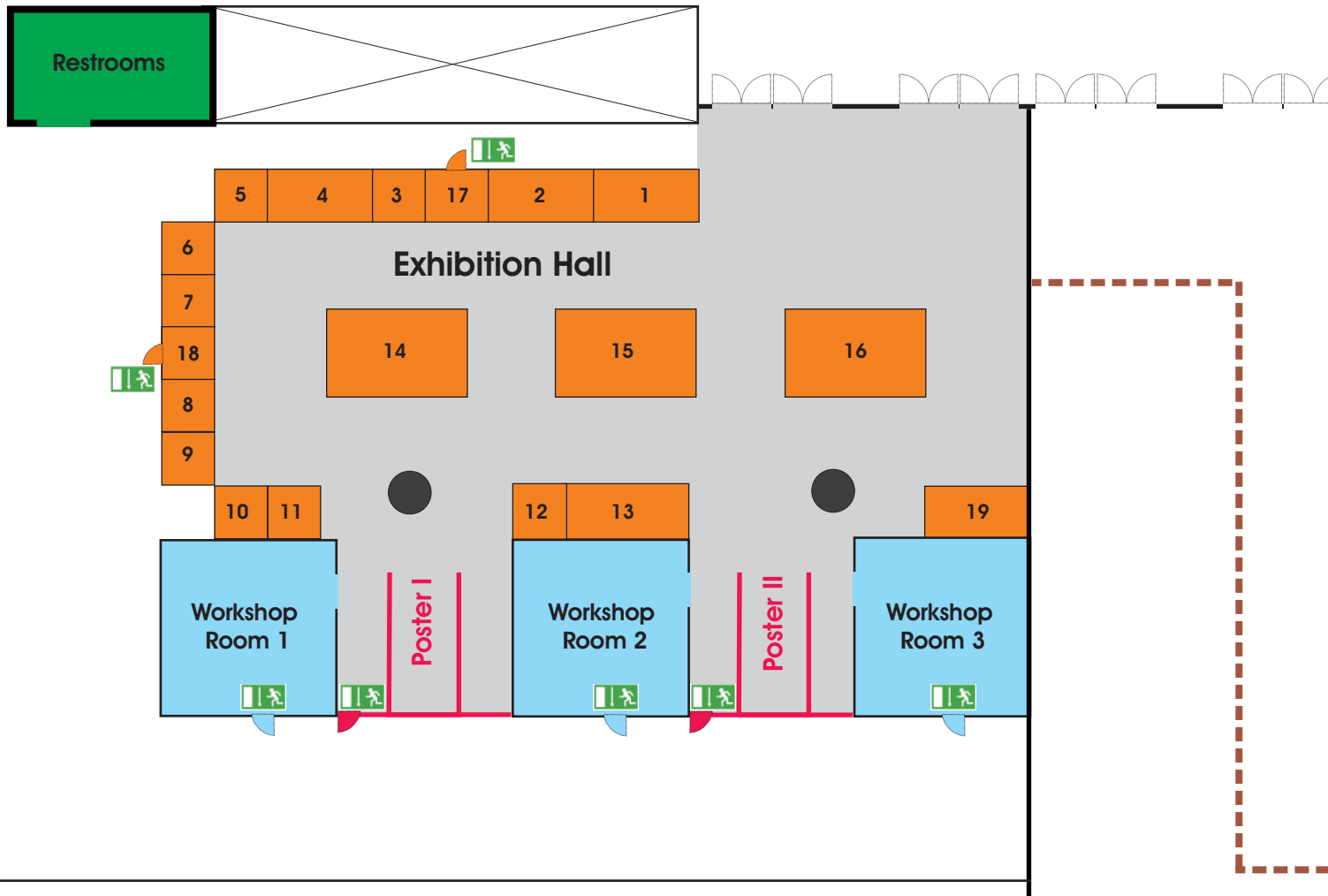
Workshop 4 (Lecture Hall)  
*Sponsored by DePuy*

18:00 END OF THE DAY

Escalator

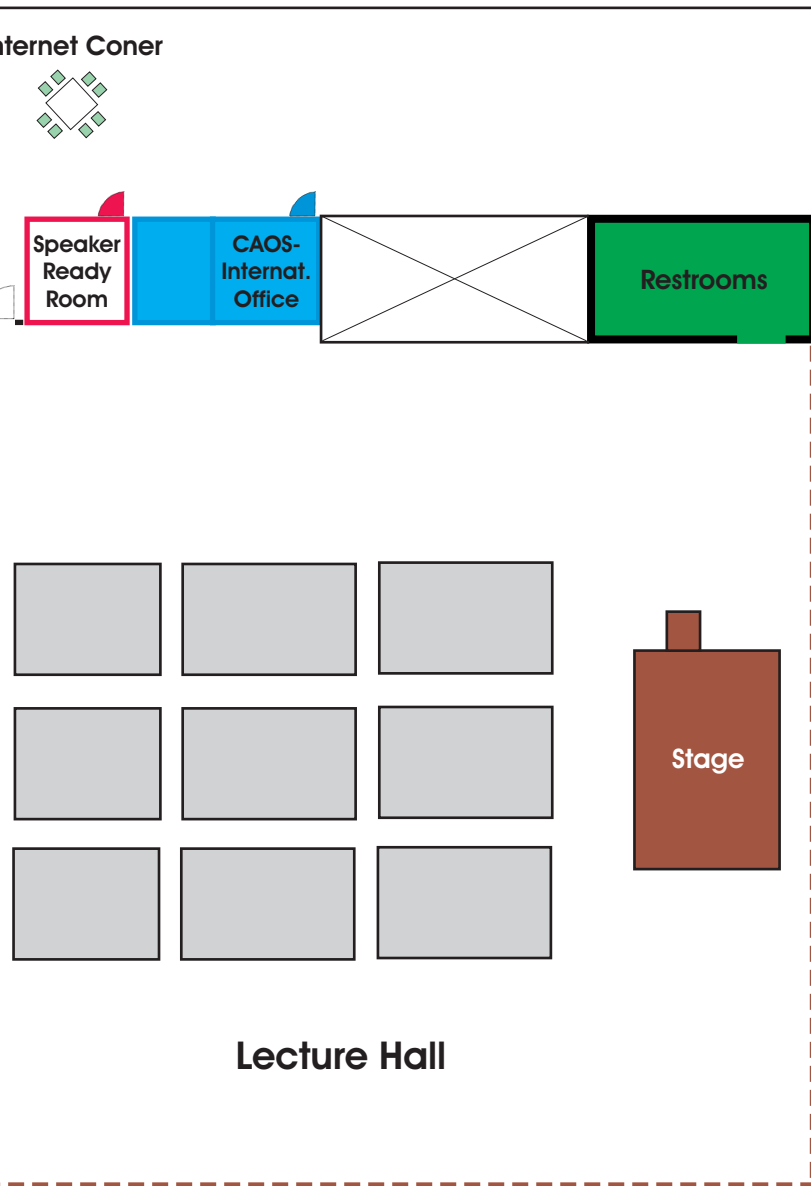
Registration Desk

Restrooms



# CAOS 2008 Exhibitors

1. NDI
2. Smith & Neph
3. Axios 3D Serv
4. Ziehm Imagin
5. Claron Techn
6. atracsys
7. NCCR Co-M
8. ZESS modiC
9. OrthoMIT



Workshop 4 will take place in the Lecture Hall.

CAOS-Asia Workshop 5 will take place in *Theater 2*, which is located on Level II.

- 10. Orthopaedics & Traumatology, CUHK
- 11. Orthopaedics & Traumatology, CUHK
- 12. Materialise
- 13. B. Braun Aesculap
- 14. DePuy
- 15. Stryker
- 16. BrainLAB
- 19. ROBODOC®

## ***Friday, June 6, 2008***

7:00 REGISTRATION

### ***Session VI – Total Hip Arthroplasty – Part 2: Clinical Studies***

**Chairmen: Michael L. Swank and Guoyan Zheng**

- 8:00 Incidence of dislocation after computer-assisted positioning of the acetabular cup for total hip arthroplasty based on joint kinematics  
*M Bhattacharyya, B Gerber*
- 8:07 Current accuracy of anterior pelvic plane registration in supine position  
*RL Thornberry, LS Nelson*
- 8:14 Imageless navigation-assisted implantation of acetabular components in revision total hip arthroplasty  
*JD Chang, JH Yoo, GS Umarani, JH Lee*
- 8:21 DISCUSSION
- 8:30 Cost-utility-analysis of a novel system for computer-aided revision total hip arthroplasty  
*R Elfring, A Zimolong, E Quack, T Hoppe, M de la Fuente, K Radermacher*
- 8:37 Pelvic tilt before and after total hip arthroplasty  
*G Klingenstein, K Eckman, B Jaramaz, SB Murphy*
- 8:44 The equidistant method: A novel, robust and accurate strategy for computer simulated femoroacetabular impingement detection  
*M Puls, SD Steppacher, KA Siebenrock, M Tannast, J Kowal*
- 8:51 DISCUSSION

### ***Session VII – Robotics and Sensors***

**Chairmen: Gabor Fichtinger and Eric Stindel**

- 9:00 A haptic device for robot-aided milling of curved bone surfaces for implants  
*NA Hungr, AJ Hodgson, C Plaskos*
- 9:07 The Acrobot Sculptor<sup>®</sup> robotic system for hands-on orthopaedic surgery  
*M Jakopec, BP Hede, SJ Harris, ARW Barrett, FM Rodriguez y Baena, MPSF Gomes, BL Davies, JP Cobb*
- 9:14 A hybrid manipulator mechanism design for a small bone attached surgical robot  
*S Song, B Jaramaz*
- 9:21 DISCUSSION
- 9:30 Fully automatic reduction of femoral shaft fractures using a surgical robot  
*M Oszwald, R Westphal, M Citak, D Kendoff, T Hufner, FM Wahl, C Krettek, T Gosling*
- 9:37 Experimental study of the bi-planar navigation robot system aided screws visualization and insertion of sacroiliac, femoral neck, and distal locking screws  
*JQ Wang, L Hu, CP Zhao, YG Su, WY Liu, Y Wang, TM Wang, MY Wang*
- 9:44 A magnetoelastic strain sensor for wireless tibia fracture healing assessment  
*NP Oess, B Weisse, BJ Nelson*
- 9:51 DISCUSSION

**Coffee Break and Poster Session, Part 2**

- 10:00 POSTERS WILL BE PRESENTED IN TWO SESSIONS, DURING WHICH THE AUTHORS WILL BE PRESENT AT THE POSTER BOOTHS. HOWEVER, ALL POSTERS OF BOTH SESSIONS WILL BE ON DISPLAY DURING THE ENTIRE TIME OF THE MEETING.
- 43) Computer-assisted mosaicplasty  
*M Kunz, JF Rudan, D Bardana, J Stewart, SD Waldman, RE Ellis*
- 44) Surface modeling of multiple bone objects by staged self-organizing map neural network  
*H Lin*
- 45) A portable trauma tele-treatment system prototype for anti-terror emergency care  
*WY Liu, JY Jiang, YW Wang, LM Fang, TM Wang, L Hu, N Huang*
- 46) Pose recovery of intramedullary nail distal hole using neural networks  
*A Lorsakul, P Uthainual, B Mahaisavariya, J Suthakorn*
- 47) A novel field-of-view augmentation wand for C-arm CT-like fluoroscopy-based intraoperative navigation  
*E Peleg, M Liebergall, L Joskowicz, Y Weil, R Mosheiff*
- 48) A method improving the workflow and the registration robustness of ultrasound-guided spine surgery  
*M Peterhans, H Talib, J Garcia, MA González Ballester*
- 49) Evidence-based implant design using a statistical bone model and automated implant fitting  
*M Reyes, P Büchler, LP Nolte, N Reimers, C Lutz, M Gonzalez*
- 50) Calibration of preoperative 2D X-ray radiographs and its potential applications in computer-assisted total hip replacement  
*S Schumann, M Tannast, LP Nolte, G Zheng*
- 51) Determination of bone healing by “intelligent” external and internal fixator systems  
*K Seide, S Maegerlein, AP Schulz, U Gerlach, C Juergens, M Faschingbauer*
- 52) Haptics and virtual reality for knee arthroscopy training: Does vibrotactile feedback help?  
*Y Tenzer, BL Davies, F Rodriguez y Baena*
- 53) Two camera augmented mobile C-arm – System setup and first experiments  
*J Traub, SM Heining, E Euler, N Navab*
- 54) Instrument tracking in endoscope images using binary ID based markers: Initial results  
*RU Thoranaghatte, LP Nolte, G Zheng*
- 55) Shape reconstruction from endoscopic images  
*C Wu, SG Narasimhan, B Jaramaz*
- 56) A CT-free surgical planning and bone resection assisted robot for total knee arthroplasty  
*PL Yen*
- 57) Post-operative alignment in total knee arthroplasty: Long leg versus short leg radiographs  
*RB Abu-Rajab, AH Deakin, M Kandasami, F Picard, AWG Kinninmonth*
- 58) The application of computer assisted surgery in revision total knee arthroplasty  
*DK Bae, SJ Song, JH Noh, WS Chang, HJ Cho*
- 59) Computer assisted total knee arthroplasty on valgus knees: Subgroup identification  
*P Basanagoudar, AH Deakin, A Vijayan, F Picard*
- 60) Effect of knee prosthesis positioning on tibio-femoral and patello femoral joint kinematics. In-vitro analysis of cruciate-retaining and posterior-stabilized design  
*C Belvedere, A Leardini, A Ensini, A Feliciangeli, L Bianchi, F Catani, S Giannini*
- 61) Perioperative fractures of the femur and tibia in computer assisted total knee arthroplasty: Identifying risk factors and correlation with rigid body trajectory  
*M Bhattacharyya, B Gerber*
- 62) Joint line restoration in navigated TKA  
*F Catani, A Ensini, L Leardini, C Belvedere, L Bianchi, A Feliciangeli, S Giannini, N Biasca*

- 63) Electromagnetic navigation in total knee arthroplasty  
*DR Cheung, Kw, DR Chiu, Kh, DR Tso, Cy*
- 64) The use of navigation to investigate the relationships between tourniquet time, pre-operative deformity and surgical experience in the varus knee  
*H Davies, SH Voon, SAC Sampath*
- 65) PiGalileo robotic navigation in total knee arthroplasty  
*T Goldberg*
- 66) Medio-lateral laxity before and after total knee replacement  
*JY Jenny, Y Diesinger, C Boeri, E Ciobanu*
- 67) How to acquire L-M stability with navigated TKA in extension and flexion: The past and the future  
*K Kanesaki, K Yamanaka, K Nagata*
- 68) Influence of weight simulation on navigated lower limb axis measurements: Cadaver testings  
*D Kendoff, M Citak, S Hankemeier, T Board, M Gardner, C Krettek, T Hüfner*
- 69) TKA with the intelligent instrument mini-robot Praxiteles – First clinical results  
*S Maegerlein, M Faschingbauer, M Wurm, S Fuchs, C Juergens, AP Schulz*
- 70) Clinical results of navigated TKA for posttraumatic arthrosis  
*S Maegerlein, S Fuchs, M Faschingbauer, C Juergens, AP Schulz*
- 71) Short term follow-up of 91 navigated uncemented E.motion knee prostheses with a 350µm plasma-spray titanium coating  
*SAC Sampath, HG Davies, SH Voon*
- 72) Rotation of the femoral component in TKR – An evaluation of the relevant axes with navigation and CT-scan  
*SG Sinz, WE Weinhandl, GI Gergely, NC Neumann, SK Sinz*
- 73) Navigated soft tissue management in severe TKA cases  
*SH Voon, HG Davies, MJ Sangster, SAC Sampath*
- 74) Bone morphing system for surgical optimization in total knee arthroplasty: Comparison of initial outcome with conventional procedure  
*H Wu, S Van Driessche, D Goutallier*
- 75) Computer navigation did not improve alignment in a lower-volume total knee practice  
*WP Yau, KY Chiu, JL Zuo, WM Tang, TP Ng*
- 76) Electromagnetic navigation in total knee arthroplasty – Comparison of our first 100 cases to our last 100 cases  
*YY Won, DS Shin, TH P, JH Hur, WQ Cui*
- 77) Orientation and position of the femoral component during TKA – What matters?  
*C König, A Sharenkov, G Matziolis, C Perka, GN Duda, MO Heller*
- 78) Prospective comparative study of ranges of motion in cruciate retaining total knee arthroplasty – High flexion vs. standard design  
*EK Song, JK Seon, SJ Park, YJ Kim, CI Hur*
- 79) Navigated hip resurfacing without using a tracking system – Back to stereotactic navigation?  
*M de la Fuente, P Belei, M Strake, T Mumme, K Radermacher*
- 80) Computer-assisted placement technique in hip resurfacing arthroplasty: Improvement in accuracy?  
*SI Krüger, PY Zambelli, PF Leyvraz, BM Jolles*
- 81) Metal-on-metal resurfacing of the hip with kinematic navigation  
*M Pink, T Pink, M Janecek, M Lisy*
- 82) Laboratory and pilot study of customized jigs for distal radius osteotomy  
*B Ma, M Kunz, M Ling, J Rudan, RE Ellis, P Abolmaesumi, D Pichora*
- 83) Evaluation of an arthroscopic-assisted fluoroscopic navigation system in the treatment of talar osteochondral lesions – A novel technique  
*PF O'Loughlin, D Kendoff, AD Pearle, JG Kennedy*
- 84) Correction of an intra-articular malunion of the distal radius using CT based preoperative planning and surgical guides for execution as an alternative for conventional navigation  
*F Stockmans, K Libberecht, J Vanhaecke, K De Smedt, N Geudens, J Dille*

**Session VIII – Total Knee Replacement – Part 2: Revision and Robotic TKR, Tool Evaluation**

**Chairmen: P.S. John and Klaus Radermacher**

- 10:55 Computer aided navigation in revision total knee arthroplasty: Does it make our job easier?  
*K Deep*
- 11:02 Errors in identification of the distal femur transepicondylar and anterior posterior axes in minimal incision TKR and conventional incision TKR using image free computer navigation system  
*WP Yau, KG Liu, CH Yan, KY Chiu*
- 11:09 A navigated 8-in-1 femoral cutting guide for total knee arthroplasty – Development and accuracy study  
*D Kendoff, C Plaskos, N Karkare, C Granchi, A Mareau-gaudry, T Sculco, A Pearle*
- 11:16 DISCUSSION
- 11:24 Imageless electromagnetic or infrared navigation in total knee arthroplasty: How to choose?  
*KW Cheung, KH Chiu, KS Lee*
- 11:31 A novel force-based tool for the determination of the Mikulicz line in TKA  
*R Elfring, W Teske, M de la Fuente, F Schmidt, M Niggemeyer, K Radermacher*
- 11:38 The short term results of robot-assisted total knee arthroplasty – 1-4 years follow-up  
*CT Lee, SH Yoon, OM Kwon, M Trabish, HJ Lee, JS Park, MR Kang*
- 11:45 Early clinical results of robot assisted minimal invasive surgical technology ( R A M I S T )  
*CT Lee, SH Yoon, OM Kwon, JS Lee, JS Park, M Kang, M Trabish*
- 11:52 DISCUSSION

**Presidential Guest Lecture 2**

- 12:00 Professor PC Leung, SBS, OBE, JP  
*Emeritus Professor of Orthopaedics and Traumatology  
The Chinese University of Hong Kong*

**Lunch Break and General Assembly of CAOS-International**

- 12:30 LUNCH WILL BE SERVED IN THE INDUSTRIAL EXHIBITION. ALL MEMBERS OF THE INTERNATIONAL SOCIETY FOR COMPUTER ASSISTED ORTHOPAEDIC SURGERY ARE KINDLY INVITED TO JOIN THE CAOS-INTERNATIONAL GENERAL ASSEMBLY IN THE LECTURE HALL.

**Session IX – Femoral Head Resurfacing**

**Chairmen: Wolfgang Müller-Wittig and Ferdinando Rodriguez y Baena**

- 13:55 Which CAOS systems can deliver adequate accuracy and precision in hip resurfacing?  
*JP Cobb, V Kannan, W Dandachli*
- 14:02 Evaluation on the functionality and accuracy of a new fluoroscopic-based navigation system for implantation of the femoral component in hip resurfacing – An in-vitro and cadaver study within the scope of the ORTHOMIT project  
*S Gravius, P Belei, M de la Fuente, R Müller-Rath, K Radermacher, DC Wirtz, T Mumme*
- 14:09 Imageless navigation in hip resurfacing: Avoiding component malposition during the surgeon learning curve  
*JR Romanowski, ML Swank*
- 14:16 DISCUSSION

**Session X – Spine and Tumor**

**Chairmen: Lutz Dürselen and Lutz Nolte**

- 14:24 Navigation in thoracic spine (T1-10) – Useful tool or toy for the surgeon?  
*S Katscher, JS Jarvers, HJ Riesner, A Franck, T Blattert, C Josten*
- 14:31 3D-fluoroscopy guidance for thoracic and lumbar fractures  
*PA Grützner, A Wentzensen, LP Nolte, J von Recum*
- 14:38 Fluoroscopy-based navigation system in spine surgery  
*P Merloz, J Troccaz, H Vouaillat, C Vasile, J Tonetti, A Eid, B Sadok, J van Overschelde*
- 14:45 Computer assisted tumor surgery (CATS): New application in CAOS  
*KC Wong, SM Kumta, GE Antonio, WK Ng, KS Lee, LF Tse*
- 14:52 DISCUSSION

**Panel Discussion 2 – Is CAOS Cost-effective?**

**Moderator: Michael L. Swank**

- 15:00 Panelists: Brian L. Davies, Kwok-Sui Leung, Dietrich Schlenzka

**Break**

- 15:30 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

**Session XI – Anterior and Posterior Cruciate Ligament Replacement**

**Chairmen: Kamal Deep and Randy E. Ellis**

- 16:00 In-vivo kinematic analysis of knee translational and rotational laxities in anatomical double-bundle ACL reconstruction: The pivot-shift test  
*N Lopomo, S Bignozzi, S Zaffagnini, S Martelli, A Visani, M Marcacci*
- 16:07 Description and clinical validation of a navigation system for intra-operative evaluation of accurate placement of bone tunnels in reconstruction of the anterior cruciate ligament  
*M Bhattacharyya, B Gerber*
- 16:14 Navigated ACL replacement achieves better isometry than conventional procedures  
*J von Recum, G Weisser, A Seitz, A Wentzensen, L Claes, L Dürselen*
- 16:21 DISCUSSION
- 16:30 3D navigation guided fixation of posterior cruciate ligament avulsion fracture  
*N Tang, KS Lee, WK Ng, KS Leung*
- 16:37 Computerized navigation technique in assisting tibial tunnel placement of arthroscopic posterior cruciate ligament reconstruction  
*H Feng, L Hong, X Wang, X Geng, H Zhang*
- 16:44 Measurement of the antero-posterior and rotational knee laxity during ACL replacement by a navigation system  
*JY Jenny, E Ciobanu, C Boeri*
- 16:51 DISCUSSION

**Educational Workshops, 2<sup>nd</sup> Iteration**

- 17:00 FOUR WORKSHOPS WILL BE PRESENTED IN PARALLEL, EACH OF THEM TWICE. THIS SCHEME WILL BE REPEATED DURING THE 2<sup>ND</sup> ITERATION. PARTICIPANTS WILL BE ASSIGNED TO FOUR DIFFERENT GROUPS AND

WILL BE GUIDED THROUGH THE WORKSHOPS. EVERY PARTICIPANT WILL ATTEND EACH WORKSHOP ONCE THROUGHOUT THE TWO ITERATIONS.

Workshop 1 (Room 1)  
*Sponsored by BrainLAB*

Workshop 2 (Room 2)  
*Sponsored by Stryker*

Workshop 3 (Room 3)  
*Sponsored by BrainLAB*

Workshop 4 (Lecture Hall)  
*Sponsored by DePuy*

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***CAOS-International Banquet***

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- 19:30 Departure of buses from the Congress Center to the CAOS-International Banquet, which will take place in the “Jumbo Kingdom”, on a floating boat centered on the Jumbo and Tai Pak Floating Restaurants in Aberdeen Harbour  
Presentation of the Maurice E. Müller Award for Excellence in Computer Assisted Surgery  
Introduction of the new CAOS-International President  
Invitation to the 9<sup>th</sup> Annual Meeting of CAOS-International in Boston
- 23:30 END OF THE DAY

## ***Saturday, June 7, 2008***

8:00 REGISTRATION

### ***Session XII – Total Hip Arthroplasty – Part 3: Measurement Issues***

**Chairmen: Justin Cobb and Christopher Plaskos**

- 8:30 Reconstructed computed tomography measurement of the anteversion of acetabular cup using image-free navigation – Validity of frontal pelvic plane  
*KJ Oh, YS Kwon, TH Kim, SH Lee, ST Lee*
- 8:37 The interrelationship among different reference coordinate systems of the pelvis – A computer assisted anatomical study  
*M Tannast, M Röthlisberger, S Gathmann, SD Steppacher, SB Murphy, F Langlotz, KA Siebenrock*
- 8:44 Surface-based vs. landmark-based determination of the mid-sagittal plane for surgery planning in THR  
*L Fieten, J Eschweiler, K Kabir, S Gravius, F Portheine, M de la Fuente, K Radermacher, DC Wirtz*
- 8:51 DISCUSSION
- 9:00 Evaluation of intraoperative pelvic positioning using software-based computed tomography/radiography matching  
*JC Chow, K Eckmann, B Jaramaz, S Murphy*
- 9:07 The orientation of the native acetabulum: A prospective 300-cases CT-based study  
*S Blendea, J Troccaz, P Merloz*
- 9:14 Imageless navigation for acetabular cup placement: Pelvic-planes and/or transverse acetabular ligament?  
*T Kalteis, E Sendtner, J Grifka, T Renkawitz*
- 9:21 DISCUSSION

### ***Session XIII – Total Knee Replacement – Part 3: Patellofemoral Kinematics and Soft Tissues***

**Chairmen: Norberto Confalonieri and Chyun-Yu Yang**

- 9:30 Patellar kinematics during computer-assisted total knee arthroplasty  
*C Anglin, E Stindel, JL Briard, C De Lambilly, C Plaskos, E Nodwell, KCT Ho, C Roux*
- 9:37 Preliminary patello-femoral joint navigation in computer assisted total knee arthroplasty. An in-vitro study  
*C Belvedere, A Leardini, A Ensini, A Feliciangeli, L Bianchi, F Catani, S Giannini*
- 9:44 Tensioning and gap kinematics in total knee arthroplasty – Navigated measurements to control influence of the patella and the posterior cruciate ligament  
*D Kendoff, C Plaskos, C Granchi, R Laskin, A Pearle, D Mayman*
- 9:51 DISCUSSION
- 10:00 Comparison of soft tissue balancing techniques in total knee replacement using computer navigation  
*YD Kamat, MK Aurakzai, Y Kalairajah, RE Field, AR Adhikari*
- 10:07 Flexion contracture correction in navigated total knee arthroplasty  
*J Ilyas, P Kumar, AH Deakin, C Brege, D Young, F Picard*
- 10:14 Computer aided gap balancing improves sagittal stability for cruciate-retaining total knee arthroplasty – Results of a prospective randomized trial  
*HN Pang, SJ Yeo, NN Lo, HC Chong, PL Chin, JCA Ong*
- 10:21 DISCUSSION

**Break**

10:30 COFFEE BREAK AT THE INDUSTRIAL EXHIBITION

**Session XIV – Ultrasound**

**Chairmen: Mauricio Reyes and Nobuhiko Sugano**

- 11:00 Full automatic ultrasound probe calibration for the computer assisted orthopaedic surgery  
*J Chaoui, G Dardenne, C Hamitouche, E Stindel, C Roux*
- 11:07 2.5D ultrasound for measuring leg geometry  
*P Keppler, V Sauer, C Bartl, J Kozak, JB Pinzuti, F Leitner, F Gebhard*
- 11:14 Surgical tool localization from 3D ultrasound volumes using 3D phase-based features  
*I Hacihaliloglu, R Abugharbieh, AJ Hodgson, RN Rohling, P O'Brien, P Guy*
- 11:21 DISCUSSION

**Session XV – Arthroscopy and Fracture Reduction**

**Chairmen: Yoshinobu Sato and Leo Joskowicz**

- 11:30 3D navigation guided arthroscopy  
*N Tang, KS Lee, WK Ng, KS Leung*
- 11:37 Navigated placement of scaphoid screws with 3D fluoroscopy  
*M Citak, T Hüfner, P O'Loughlin, M Oszwald, C Krettek, R Gaulke, T Stübig, D Kendoff*
- 11:44 Navigated control in reduction of tibial plateau depression fractures  
*T Hüfner, D Kendoff, P Bretin, P O'Loughlin, T Stübig, C Krettek, M Oszwald, M Citak*
- 11:51 Patient specific FEA of femoral fracture fixations: methodology and experimental validation  
*E Peleg, M Liegerrgall, L Joskowicz, A Gefen, R Mosheiff*
- 11:58 DISCUSSION

**CAOS-International Travel Fellowships – Reports by the 2006 Fellows**

- 12:10 Influence of leg axis correction on lengthening of the ACL  
*Daniel O. Kendoff*
- 12:25 Computer assisted surgical planning  
*Hong Lin*

**Scientific Awards Ceremony**

- 12:40 Best clinical podium presentation award  
*Sponsored by B. Braun Aesculap*
- Best technical podium presentation award  
*Sponsored by Ziehm Imaging*
- Best clinical poster presentation award  
*Sponsored by B. Braun Aesculap*
- Best technical poster presentation award  
*Sponsored by B. Braun Aesculap*

**Closing**

- 12:55 Closing remarks  
*Kwok-Sui Leung*

***Venue Information***

**Venue**                      Hong Kong Convention and Exhibition Center  
1 Expo Drive  
Wanchai, Hong Kong  
China

**During the Meeting**      CAOS2008@CAOS-International.org

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