# PROF. DR. JÉRÔME SCHMID

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*Born January 16th, 1979. Married with one child. Swiss citizen*

**Haute école de santé de Genève**
Technique en radiologie médicale
47 av. de Champel – 1206 Genève

## PROFESSIONAL EXPERIENCE

| 2011-* | SCHOOL OF HEALTH SCIENCES (HEDS), UNIVERSITY OF APPLIED SCIENCES AND ARTS OF WESTERN SWITZERLAND (HES-SO) | GENEVA SWITZERLAND |
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**September 2011 — Now**  **Full Professor**
- Professor in the Dept. of Radiologic Medical Imaging Technology

| 2007-11 | MIRALab, UNIVERSITY OF GENEVA | GENEVA SWITZERLAND |
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**May 2007 — January 2011**  **Research Assistant**
- Research assistant and PhD candidate involved in project management and writing of European (FP7 STREP, IP, Marie Curie ITN) and national (FNRS division 2) grant proposals

| 2005-07 | PRINCE OF WALES HOSPITAL | HONG KONG |
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**March 2005 — March 2007**  **Project Manager**
- Responsible of a R&D team working on medical imaging and computer-assisted surgery (tracking systems, pre-/intra-operative image segmentation, augmented reality and multimodal registration)

| 2003-04 | INSTITUT DE RECHERCHE CONTRE LES CANCERS DE L'APPAREIL DIGESTIF (IRCAD) | STRASBOURG FRANCE |
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**November 2003 — November 2004**  **R&D Engineer**
- Engineer in the augmented reality research team (computer vision, camera calibration and stereoscopic reconstruction for augmented reality in surgical applications)

## EDUCATION AND CERTIFICATIONS

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| **October 2014** | 1.5 ECTS course on Clinical Best Practices required by Swiss OClin ordinance (art 6 al 1.a) |
| **May 2007 – Jan. 2011** | MIRALAB, UNIVERSITY OF GENEVA<br>Ph.D. in Computer Sciences awarded with first class honors<br>Thesis: « Knowledge-based Deformable Models for Medical Image Analysis » |
| **Sept. 2000 – July 2003** | ENG. SCHOOL ENSIMAG, GRENOBLE, FRANCE<br>Engineer diploma in Computer Sciences and Applied Mathematics awarded with honors 2:1, Specialty in Image and Virtual Reality |

## AWARDS

- "Quality of Life" prize 2019 delivered by the Dalle Molle Foundation for FAI project "Development and Validation of A Multi-modal Image-based Model Generation Method for Non-invasive Dynamic Assessment of Femoroacetabular Impingement"
- Eurographics 2009 "Medical Prize" First Prize for paper "Virtual Hip Joint: from Computer Graphics to Computer-Assisted Diagnosis" (In collaboration with MIRALab medical team and HUG)

# R&D PROJECTS

Over 1 MCHF of granted funding for research and development since 2012 among which more than 60% are external to HES-SO funding actions. List of major projects:

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| **Feb. 2022 – June 2023** | Project "DeepDAT", private funding (main applicant) |
| **Jan. 2022 – Dec. 2024** | Project "SUBREAM", Swiss Cancer Research (main applicant) |
| **April 2019 – Nov. 2020** | **Project "AIRx"**, Hasler Stiftung funding (main applicant) |
| **April 2018 – Sep. 2020** | **Project "Novel digital X-ray imaging detector"**, Innosuisse funding (co-applicant) |
| **Dec. 2016 – Dec. 2018** | **Project "MyPlanner"**, CTI funding (main applicant) |
| **Jan. 2016 – June 2018** | **Project "GlobalDiagnostiX" (prototype II)**, HES-SO funding (co-applicant) |
| **Sept. 2015 – Dec. 2018** | **Project "FAI"**, SNSF funding Div. II (co-applicant) |
| **Sept. 2014 – April 2015** | **Project "GlobalDiagnostiX" (prototype I)**, HES-SO funding (co-applicant) |
| **Feb. 2012 – Jan. 2014** | **Project "MyHip"**, CTI funding (main applicant) |

# TEACHING ACTIVITIES

- Responsible of and lecturer in HES-SO BSc (40 ECTS) and HES-SO/Unil MSc (10 ECTS) modules.
- Lecturer in optional courses of the Geneva University Faculty of Medicine.

# SUPERVISION ACTIVITIES

- Direction and co-direction of 4 PhD students since 2020.
- Director of 14 theses (37 students) in HES-SO BSc curriculum since 2012, Director of 5 theses (8 students) in HES-SO Master of Health Sciences (MScSA) curriculum since 2017.
- Jury member and scientific advisor of 3 PhD students (ETHZ, Old Dominion University USA) since 2012.

# MEMBERSHIPS AND REVIEWING ACTIVITIES

- Member of the European Societies of Radiology (ESR) and for Hybrid, Molecular and Translational Imaging (ESHI).
- Active member of the scientific reviewing board of the HEdS since 2012.
- Previous member of reviewing board the health domain of the HES-SO during 8 years.
- Reviewer for The Health and Medical Research Fund of Hong Kong, S.A.R., The French National Research Agency (ANR).
- Reviewer for peer-reviewed journals and conferences: Signal Imag Video Process, Med Imag Anal, IEEE Trans Biomed Eng, IEEE Trans Med Imag, IEEE Trans Visual Comput Graph, IEEE J Biomed Health Informat, and MICCAI conference.
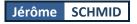
# DISSEMINATION ACTIVITIES

- 17 peer-review journal papers, 1 book chapter, 29 conference abstracts/proceedings, 3 tutorials and 9 invited lectures.
- Member of conference program and main organizer of 3D Physiological Human Workshops 2008 and 2009, 3D Anatomical Human Summer School 2010 and Digital Health Summer School 2016.

# PUBLICATIONS

## Journal articles

- F. D'Isidoro, C. Chênes, S.J. Ferguson, **J. Schmid**, "A new 2D-3D registration gold-standard dataset for the hip joint based on uncertainty modeling". Medical Physics 48(10), pp. 5991-6006. https://doi.org/10.1002/mp.15124, 2021.
- R. Haq, **J. Schmid**, R. Borgie, J. Cates, M. Audette, "Deformable Multi-surface Segmentation of the Spine for Orthopedic Surgery Planning and Simulation". Journal of Medical Imaging 7 (1), 015002 (10.1117/1.JMI.7.1.015002), 2019.
- R. Huang, A. Nedanoski, D.F. Fletcher, N. Singh, **J. Schmid**, P.M. Young, N. Stow, L. Bi, D. Traini, E. Wong, C.L. Phillips, R. Grunstein, J. Kim, "An automated segmentation framework for nasal computational fluid dynamics analysis in computed tomography". Computers in biology and medicine 115, 103505 (10.1016/j.compbiomed.2019.103505), 2019.
- D. Damopoulos, T.D. Lerch, F. Schmaranzer, M. Tannast, C. Chênes, G. Zheng, **J. Schmid**, "Segmentation of the proximal femur in radial MR scans using a random forest classifier and deformable model registration". International Journal of Computer Assisted Radiology and Surgery, vol. 14(3), pp. 545-561, 2019.
- **J. Schmid**, C. Chênes, S. Chagué, P. Hoffmeyer, P. Christofilopoulos, M. Bernardoni, C. Charbonnier, "MyHip: Supporting Planning and Surgical Guidance for a Better Total Hip Arthroplasty", International Journal of Computer Assisted Radiology and Surgery, vol. 10(10), pp. 1547-1556, 2015.
- C. Charbonnier, S. Chagué, **J. Schmid**, F.C. Kolo, M. Bernardoni, P. Christofilopoulos, "Analysis of Hip Range of Motion in Everyday Life: A Pilot Study," Hip International, vol. 25(1), pp. 82-90, 2014.
- C. Charbonnier, S. Chagué, C. Chênes, P. Hoffmeyer, P. Christofilopoulos, M. Bernardoni, **J. Schmid**, "Post-operative Kinematics Assessment in Patients after Total Hip Arthroplasty: A Pilot Study," Swiss Med wkly, Suppl. 204, 144:37S, 2014.
- P. Christofilopoulos, S. Chagué, **J. Schmid**, P. Bartolone, P. Hoffmeyer, C. Charbonnier, "Accuracy assessment of Hip Clinical Exam," Swiss Med Wkly, Suppl. 198, 143:27S, 2013.
- P. Christofilopoulos, S. Chagué, **J. Schmid**, P. Hoffmeyer, C. Charbonnier, "Hip Range of Motion in Everyday Life", Swiss Med Wkly, Suppl. 198, 143:27S, 2013.
- E. Arbabi, **J. Schmid**, R. Boulic, D. Thalmann, N. Magnenat-Thalmann. "Sensitivity of hip tissues contact evaluation to the methods used for estimating the hip joint center of rotation," Med Biol Eng Comput, 50(6):595-604, 2012.
- **J. Schmid**, J. Kim, N. Magnenat-Thalmann, "Robust Statistical Shape Models for MRI Bone Segmentation in Presence of Small Field of View," Medical Image Analysis, vol. 15, no. 1, pp. 155–168, 2011.
- **J. Schmid**, J. Kim, N. Magnenat-Thalmann, "Extreme leg motion analysis of professional ballet dancers via MRI segmentation of multiple leg postures," International Journal of Computer Assisted Radiology and Surgery, vol. 6, no. 1, pp. 47–57, 2011.

- **J. Schmid**, J. Iglesias Guitián, E. Gobbetti, N. Magnenat-Thalmann, "A GPU framework for parallel segmentation of volumetric images using discrete deformable models," The Visual Computer Journal, Special Issue 3DAH, vol. 27, no. 2, pp. 85-95, 2011.

- F. Chung, **J. Schmid**, N. Magnenat-Thalmann, H. Delingette, "Comparison of statistical models performance in case of segmentation using a small amount of training datasets," The Visual Computer Journal, Special Issue 3DAH, vol. 27, no. 2, pp. 141-151, 2011.

- S. Han, N. Nijdam, **J. Schmid**, J. Kim, and N. Magnenat-Thalmann, "Collaborative telemedicine for interactive multiuser segmentation of volumetric medical images," The Visual Computer Journal, Proc. CGI 2010, vol. 26, no. 6-8, pp. 639–648, 2010.

- L. Assassi, C. Charbonnier, **J. Schmid**, P. Volino, and N. Magnenat-Thalmann, "From MRI to Anatomical Simulation of the Hip Joint," Computer Animation and Virtual Worlds Journal, Special Issue on Physiological Human, vol. 20, no. 1, pp. 53–66, 2009.

- L.W. Sun, F. Van Meer, **J. Schmid**, Y. Bailly, A.A. Thakre, C.K. Yeung, "Advanced simulator for surgeon training and operation planning in Robotic Assisted Minimally Invasive Surgery," The International Journal of Medical Robotics and Computer Assisted Surgery, vol. 3, pp. 245-251, 2007.

## Conference abstracts and articles

- C. Chênes, D. Locarnini, D. Perréard, B. Sierra Paulino, **J. Schmid**, "Can artificial intelligence compete with radiographers in characterizing radiographs of the upper limb?", Swiss Congress of Radiology 2022.

- C. Chênes, M. Butt, S. Mahamat, M. Muanga Bonga, S. Fazeli, **J. Schmid**, "AIRx: Augmenting the teaching of radiography using artificial intelligence", European Congress of Radiology 2022.

- **J. Schmid**, A. Arrigo, G. Favre-Gillioz, N. Nicastro, V. Garibotto, "Investigating data fusion and training strategies of artificial intelligence for the diagnosis of Parkinson's disease with Dopamine SPECT imaging", European Congress of Radiology 2022.

- A. Tapp, C. Payer, **J. Schmid**, M. Polanco, I. Kumi, S. Bawab, S. Ringleb, C. St. Remy, J. Bennett, R. Singh Kakar, M. Audette, "Generation of Patient-Specific, Ligamentoskeletal, Finite Element Meshes for Scoliosis Correction Planning", Medical Image Computing and Computer Assisted Intervention (MICCAI) CLIP Workshop, Strasbourg, Sept. 2021. (best paper award)

- C. Chênes, **J. Schmid**, "Revisiting contour-driven and knowledge-based deformable models: application to 2D-3D proximal femur reconstruction from X-ray images", Medical Image Computing and Computer Assisted Intervention (MICCAI), vol. LNCS 12906, no. 6. Springer-Verlag, 2021, pp. 451–460, Strasbourg, Sept. 2021.

- A. Arrigo, G. Favre-Gillioz, V. Garibotto, **J. Schmid**, "Artificial intelligence for the diagnosis of Parkinson's disease with Dopamine SPECT imaging: the more data, the better the AI?", Swiss Congress of Radiology 2021, **Accepted but cancelled due to COVID.**

- M. Butt, C. Chênes, **J. Schmid**, "AIRx: when artificial intelligence embraces the teaching of radiography", Swiss Congress of Radiology 2021, **Accepted but cancelled due to COVID.**

- M. Butt, C. Chênes, **J. Schmid**, "Is artificial intelligence suitable to detect human positioning in radiography", Medical Informatics Europe 2020, **Accepted but cancelled due to COVID.**

- M. Butt, C. Chênes, **J. Schmid**, "Artificial intelligence in radiography : an assistance for patient positioning", Swiss Congress of Radiology 2020, **Accepted but cancelled due to COVID.**

- B. Lokaj, K. Kinkel, J.-N. Hyacinthe, **J. Schmid**, C. Gaignot, "Evaluation of an ultra-fast 4D sequence for detection of breast lesions in MRI", ISMRM, Sydney, 2020.
- A. Al-Musibli, O. Cagdas, X. Montet, **J. Schmid**, "Deep learning in osteoarticular imaging : the role of the radiographer", Swiss Congress of Radiology 2019, St-Gallen, June 2019.
- M.A. Audette, **J. Schmid**, C. Goodmurphy, M. Polanco, S. Bawab, A. Tapp, H. Sheldon St-Clair, "Towards a Deformable Multi-Surface Approach to Ligamentous Spine Models for Predictive Simulation-Based Scoliosis Surgery Planning", Computational Methods and Clinical Applications for Spine Imaging, 5th International Workshop and Challenge, CSI 2018.
- **J. Schmid**, C. Chênes, "Segmentation of X-ray Images by 3D-2D Registration based on Multibody Physics," in Proc. ACCV, LNCS 9004, Pt II, pp. 674-687, November 2014.
- **J. Schmid**, C. Chênes, S. Chagué, P. Hoffmeyer, P. Christofilopoulos, M. Bernardoni, C. Charbonnier, "Computer-assisted Total Hip Arthroplasty: from Pre-operative Planning to Post-operative Assessment," in Proc. of 14th Annual Meeting of the International Society for Computer Assisted Orthopaedic Surgery (CAOS), Milan, Italy, June 2014.
- **J. Schmid**, C. Chênes, S. Chagué, P. Christofilopoulos, C. Charbonnier, M. Bernardoni, "MyHip: Personalized Planning and Surgical Guidance in Total Hip Arthroplasty," In Proc. of Swiss Congress for Health Professions (SCHP), Bern, Switzerland, March 2014.
- P. Christofilopoulos, S. Chagué, **J. Schmid**, P. Bartolone, P. Hoffmeyer, C. Charbonnier, "Using Motion Capture and MRI to Accurately Determine the Hip Range of Motion in Everyday Life," In Proc. of the 26th Annual Congress of the International Society of Technology in Arthroplasty (ISTA), Miami, Florida, October 2013.
- N. Magnenat-Thalmann, **J. Schmid**, L. Assassi, and P. Volino, "A Comprehensive Methodology to Visualize Articulations for the Physiological Human," in Proc. Cyberworlds. IEEE Computer Society, DOI:10.1109/CW.2010.41, Singapore, October 2010.
- **J. Schmid**, J. Kim, and N. Magnenat-Thalmann, "Coupled Registration-Segmentation: Application to Femur Analysis with Intra-subject Multiple Levels of Details MRI Data," in Proc. of Medical Image Computing and Computer Assisted Intervention (MICCAI), vol. LNCS 6362, no. 2. Springer-Verlag, 2010, pp. 562–569, Beijing, China, September 2010.
- I. Ciuciu, H. Kang, R. Meersman, **J. Schmid**, N. Magnenat-Thalmann, J. Antonio Iglesias Guitián, E. Gobbetti, "Collaborative Semantic Content Management: an Ongoing Case Study for Imaging Applications," In Proc. 11th European Conference on Knowledge Management (ECKM), pp. 257-267, September 2010.
- **J. Schmid**, N. Nijdam, S. Han, J. Kim, and N. Magnenat-Thalmann, "Interactive Segmentation of Volumetric Medical Images for Collaborative Telemedicine," in Modelling the Physiological Human, Proc. 3DPH, vol. LNCS 5903. Springer, pp. 13–24, December 2009.
- C. Charbonnier, **J. Schmid**, F. Kolo-Christophe, N. Magnenat-Thalmann, C. Becker, and P. Hoffmeyer, "Virtual Hip Joint: from Computer Graphics to Computer-Assisted Diagnosis," in Eurographics 2009 - Medical Prize (**First prize award**). Eurographics Association, pp. 1–4, April 2009.
- N. Magnenat-Thalmann, **J. Schmid**, H. Delingette, M. Agus, J. A. Iglesias Guitian. 3D Anatomical Modelling and Simulation Concepts. Proc. of Eurographics Tutorial Notes), Eurographics Association, pp. 241-247, April 2009.

- **J. Schmid** and N. Magnenat-Thalmann, "MRI Bone Segmentation using Deformable Models and Shape Priors," in Proc. MICCAI, vol. LNCS 5241. Springer-Verlag, pp. 119–126, September 2008.
- N. Magnenat-Thalmann, C. Charbonnier, and **J. Schmid**, "Multimedia Application to the Simulation of Human Musculoskeletal System: A Visual Lower Limb Model from Multimodal Captured Data," in Proc. MMSP. IEEE Publisher, pp. 520–525, October 2008.
- Z. Zhang, **J. Schmid**, M.K. Soo, Y. Bailly, C.K. Yeung, "Multi-scale Adaptive Mask 3D Rigid Registration of Ultrasound and CT Images," Proc. BMVC, 2007.
- L.W. Sun, F. Van Meer, **J. Schmid**, A.A. Thakre, C.K. Yeung, "Optimal trocar port placement and pose selection of the da vinci robot for collision free interventions in robotically-assisted endoscopic surgery," Proc. MIRA, 2007.
- L.W. Sun, F. Van Meer, J. Philippi, **J. Schmid**, A.A. Thakre, C.K. Yeung, "Design and development of a medical robot simulator for da Vinci robot with kinematics constraints and contact force feedback," Proc. MIRA, 2007.
- S. Nicolau, **J. Schmid**, X. Pennec, L. Soler, N. Ayache, "An augmented reality & virtuality interface for a puncture guidance system: Design and validation on an abdominal phantom," Proc. MIAR, Springer Berlin Heidelberg, LNCS vol. 3150, pp. 302-310, 2004.
- L. Soler, S. Nicolau, **J. Schmid**, C. Koehl, J. Marescaux, X. Pennec, N. Ayache, "Virtual Reality and Augmented Reality in Digestive Surgery". Proc. ISMAR, pp. 278-279, 2004.

## CONTRIBUTION TO BOOKS

- **J. Schmid**, A. Sandholm, F. Chung, D. Thalmann, H. Delingette, and N. Magnenat-Thalmann, "Musculoskeletal simulation model generation from MRI datasets and motion capture data," in Recent Advances in the 3D Physiological Human. Springer-Verlag, 2009, pp. 3–19, ISBN 978-1-84882-564-2.

## OTHER PERTINENT PUBLICATIONS

- **J. Schmid**, "Knowledge-based Deformable Models for Medical Image Analysis," PhD thesis, University of Geneva, 2011.

# ACTIVE PARTICIPATIONS TO SCIENTIFIC EVENTS

## CONFERENCES & SCIENTIFIC MEETINGS

- "Principes fondamentaux de l'intelligence artificielle moderne", Scientific conference on artificial intelligence : quo vadis medical and therapeutical imaging?, HESAV, March 2022 (invited talk).
- "IA : Intelligence artificielle ou augmentée ? En route vers l'acceptation de l'IA", Scientific conference on artificial intelligence : quo vadis medical and therapeutical imaging?, HESAV, March 2022 (invited talk).
- "AI in medical imaging: augmented or artificial intelligence?", Multidisciplinary Seminar Series, Federal University of Rio, November 2020 (invited talk).
- "Multi-Modal Image-Based Model Generation Method for Non-Invasive Dynamic Assessment of Femoroacetabular Impingement", Dalle Molle Quality of Life 2019 award (invited talk).
- "My personalized biomedical model: when medical imaging supports computer-assisted diagnosis and intervention", *Biomedical Engineering conference*, June 2017 (Invited talk).

- "MyPlanner: implementing advanced processing of clinical 2D X-ray imaging into optimal individualized planning and intraoperative assistance for total joint arthroplasty", *CTI Medtech Event*, Bern, Switzerland, June 2017 (poster)

- "My Personalized anatomical model : when medical imaging supports computer-assisted diagnosis and intervention", HES@Campus Biotech, April 2017 (invited talk).

- "Medical imaging workshop", *Digital Health 2016 Summer School*, Geneva, June 2016 (organizer and lecturer).

- "Arthroplastie totale de la hanche assistée par ordinateur", *Colloque Santé Digitale*, Geneva, November 2014 (invited talk).

- "Segmentation of X-ray Images by 3D-2D Registration based on Multibody Physics", *Asian Conference on Computer Vision (ACCV)*, Singapore, November 2014 (poster).

- "Computer-assisted Total Hip Arthroplasty: from Pre-operative Planning to Post-operative Assessment". *Annual Computer-Assisted Orthopaedic Surgery (CAOS) conference*, Milan, June 2014 (poster).

- "MyHip: Personalized Planning and Surgical Guidance in Total Hip Arthroplasty", *Swiss Congress for Health Professions (SCHP)*, Bern, March 2014.

- "MyHip: Patient-specific Pre-operative Planning and Intra-operative Surgical Guidance for Total Hip Arthroplasty", *CTI Medtech Event*, Bern, Switzerland, August 2013 (poster)

- « MyHip: une approche dynamique et personnalisée de l'arthroplastie totale de la hanche chez la personne âgée », *Healthy Ageing conference*, Geneva, Switzerland, 2013 (invited talk).

- "MyHip: Patient-specific Pre-operative Planning and Intra-operative Surgical Guidance for Total Hip Arthroplasty", *CTI Medtech Event*, Lucerne, Switzerland, September 2012 (poster)

- "3D anatomical functional models for the human musculoskeletal system", *Virtual Physiological Human Conference*, Université Libre Bruxelles, Brussels, Belgium, 1st October 2010.

- "Coupled Registration-Segmentation: Application to Femur Analysis with Intra-subject Multiple Levels of Details MRI Data", *13th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, CNCC, Beijing, Chine, 20-23 September 2010 (poster).

- "Extreme leg motion analysis of professional ballet dancers via MRI segmentation of multiple leg postures", *International Congress on Computer Assisted Radiology and Surgery (CARS)*, University Medical Center, Geneva, Switzerland, 26 June 2010.

- "A GPU framework for parallel segmentation of volumetric images using discrete deformable models", *2nd 3D Anatomical Human Summer School*, Minoa Palace, Chania, Greece, 23 May 2010.

- "Interactive Segmentation of Volumetric Medical Images for Collaborative Telemedicine", *2nd Workshop on the 3D Physiological Human*, Alex Hotel, Zermatt, Suisse, 30 November 2009.

- "Medical Image Segmentation: a Synergy of Medical Imaging and Computer Graphics", *Eurographics Italian Chapter 2009*, Università di Verona, Verona, Italy, 22 October 2009. **(**invited lecture**)**

- "MRI Bone Segmentation using Deformable Models and Shape Priors", *11th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, New York University, New York, USA, 7-9 September 2008 (poster).

- "An Augmented Reality & Virtuality Interface for a Puncture Guidance System: Design and Validation on an Abdominal Phantom", *Second International Workshop on Medical Imaging and Augmented Reality (MIAR)*, Beijing, China, 19 August 2004.

## TUTORIALS

- « 3D Anatomical Modelling and Simulation Concepts », *Eurographics 2009 Tutorial no. 6*, TUM, Munich, Germany, 31 March 2009.
- « ITK and VTK programming », *3D Anatomical Human Technical Training*, Istituti Ortopedici Rizzoli, Bologna, Italy, 21 October 2008.
- « Methods of segmentation and modeling of the hip », *1st 3D Anatomical Human Summer School*, CRS4, Pula, Italy, 21 Mai 2008.