Pietro Cerveri, Ph.D.
Biomedical Engineering Department
Politecnico di Milano
via Golgi 39 - 20133 Milano, Italy
Tel. Office **+39-02-2399-3352**
Tel. Lab **+39-02-2399-9021/27**
Tel. Office CNAO **+39-0382-078-229**
Fax. **+39-02-2399-3360**
Mobile **+39-331-6996757**
E-Mail. pietro.cerveri@polimi.it
Webpage: http://www.biomed.polimi.it/BioIntro/personale/docente/cerveri.htm
Labpage: http://cartcas.polimi.it

Pietro Cerveri è nato il 22 Aprile 1969 a Milano – Italia. Ha ottenuto il titolo di Laurea in Ingegneria Elettronica nel 1994. Da Marzo 1995 a Giugno 1996 ha prestato servizio militare in qualità di Ufficiale di complemento nell'Arma dei Carabinieri. Da Settembre 1996 alla fine del 1998 ha lavorato in qualità di Assistente di ricerca presso l'istituto di neuroscienze e bioimmagini del CNR di Milano. Nel 1998 ha iniziato il dottorato di ricerca in Bioingegneria presso il Dipartimento di Bioingegneria del Politecnico di Milano e ha ottenuto il titolo nel 2001 con la tesi "Symbolic Representation of Human Anatomical Knowledge. Attempting Integration with Visual Information". Il programma di dottorato e' stato condotto nell'ambito del progetto internazionale "Visible Human Dataset project" finanziato dal National Institute of Health (Bethesda, MD – USA). Dal 2001 al 2007, è stato Assegnista di ricerca presso il Dipartimento di Bioingegneria del Politecnico di Milano e Professore a Contratto del corso Ingegneria dei Sistemi Cognitivi nel Corso di Laurea magistrale in Ingegneria Biomedica (Facoltà di Ingegneria dei Sistemi) del Politecnico di Milano. Dal 2008, è Ricercatore di Ruolo presso il Dipartimento di Bioingegneria del Politecnico di Milano. Dal 2009, è Docente del corso di Neuroingegneria (Facoltà di Ingegneria dei Sistemi) .

Pietro Cerveri ha trascorso all'estero i seguenti periodi, in cui ha svolto attività di ricerca e insegnamento, presso National Institute of Health, Bethesda MD, USA in qualità di Ricercatore (1998), Universita Estadual de Campinas, Campinas Brasile in qualità di Professore Invitato (2003, 2010), Electronic Arts, Vancouver CA, in qualità di Software Enigineer). Le sue principali attività di ricerca riguardano: Visione artificiale, Biomeccanica del movimento, Informatica medica, Immagini biomediche, Chirurgia assistita al Computer, Radioterapia e Robotica medica.

CARRIERA ACCADEMICA

- 1994 Laurea in Ingegneria Elettronica - Politecnico di Milano
- 2001 Dottorato di Ricerca in Bioingegneria - Politecnico di Milano
- 2001-2006 Assegnista di ricerca presso il Dipartimento di Bioingegneria - Politecnico di Milano
- 2006-2008 Consulente del Dipartimento di Bioingegneria – Politecnico di Milano
- 2004–2008 Professore a contratto del corso Ingegneria dei Sistemi Cognitivi (5CFU) – Corso di Laurea in Ingegneria Biomedica - Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano
- 2008-2010 Ricercatore universitario di Ruolo non confermato, Politecnico di Milano (Settore: ING-INF 06)
- 2010 Ricercatore universitario di Ruolo confermato, Politecnico di Milano (Settore: ING-INF 06)
- 2008-2009 Docente del corso Ingegneria dei Sistemi Cognitivi (compito istituzionale), Corso di Laurea in Ingegneria Biomedica - Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano
- dal 2009 Docente del corso Neuroengegneria (parte II 5CFU) (compito istituzionale), Corso di Laurea in Ingegneria Biomedica - Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano

PARTECIPAZIONE A PROGETTI DI RICERCA E INDUSTRIALI

- ***2013-2015*** *Progetto Nazionale* finanziato da Ministero dell'Istruzione dell'Università e della Ricerca. "Protesi di mano biomeccatroniche dotate di percezione tattile bioispirata, interfacce neurali bi-

direzionali e controllo sensori-motorio distribuito". P.I. E. Guglielmelli - Università "Campus Bio-Medico" ROMA. Ruolo: Co-Responsabile – Unità di Ricerca Politecnico di Milano (1.2M€).

- ***2012-2014*** *Progetto Nazionale* finanziato da AIRC Short-term high precision radiotherapy for early prostate cancer with concomitant boost on the dominant lesion**.** P.I. Dr. B. A. Alicja Jereczek. Ruolo: Responsabile Unità Operativa Politecnico di Milano (450k€).
- ***2012-2013*** *Progetto Industriale* finanziato da CNAO (Centro Nazionale di Adroterapia Oncologica). "Sviluppo di un sistema di imaging robotica per una sala di trattamento di adron-terapia". P.I. G. Baroni - Politecnico di Milano. Ruolo: .Responsabile di Workpackage.
- ***2010-2013*** *Progetto di ricerca Europeo "*ULICE - Union of Light Ion Centers in Europe" FP7-INFRA-2008-1.1.2). P.I. G. Baroni - Politecnico di Milano. Ruolo: Partecipante.
- ***2010-2013*** *Progetto di ricerca Europeo "*ENVISION - *European NoVel Imaging Systems for ION therapy" N. 241851.* P.I. G. Baroni - Politecnico di Milano Ruolo: Partecipante.
- ***2010-2014*** *Progetto Europeo* EU-US ATLANTIS PROGRAMME, COOPERATION IN HIGHER EDUCATION AND TRAINING. "CRISP - International Dual Degree in Computing, Robotics and Imaging for Surgery Platform" P.I. G. Baselli - Politecnico di Milano. Ruolo: Responsabile tecnico e scientifico (144k€).
- ***2010-2012*** *Progetto Nazionale* finanziato da Ministero dell'Istruzione dell'Università e della Ricerca "Innovative modular micro robotic instruments for transluminal endoscopic surgery". P.I. P. Cerveri – Unità di Ricerca Politecnico di Milano (135k€).
- ***2009-2010*** *International Project* finanziato da European Space Agency: TEC-MMG/2009/8 "Self propelled Instrument Carrier for surgery through natural orifices". P.I. P. Cerveri - Politecnico di Milano (25k€).
- ***2008-2010*** *Progetto di ricerca Europeo* "ROBOCAST: ROBOt and sensors integration for Computer Assisted Surgery and Therapy" (FP7-ICT-2007-215190). P.I. G. Ferrigno - Politecnico di Milano. Ruolo: Responsabile di Workpackage (3.5M€).
- ***2008-2009*** *Progetto Interuniversitario* finanziato da Politecnico di Milano e Politecnico di Torino "ORTHOROB, ORTHOpaedic Surgery and ROBotics" P.I. G. Ferrigno - Politecnico di Milano. Ruolo: Responsabile di Workpackage (75k€).
- ***2007*** *Progetto di ricerca Collaborativa Regionale* finanziato da FSE INGENIO e regione Lombardia "New technologies for surgical navigation". P.I. P. Cerveri - Politecnico di Milano. (30K€).
- ***2006-2007*** *Progetto di ricerca industriale italiano* finanziato da LIMA Lto (Udine, Italia). "Ultrasound for detection of landmarks and anatomical surfaces in surgical navigation". P.I. R. Dellaca' - Politecnico di Milano. Ruolo: partecipante (130k€).
- ***2005-2007*** *Progetto di ricerca nazionale* finanziato da Ospedale San Bortolo (Vicenza, Italia). "Innovative methods for 3D image registration in the domain of radiosurgery using the CyberKnife". P.I. C. Francescon - San Bortolo Hospital. Ruolo: partecipante (70k€).
- ***2005-2006*** *National Industrial Research Project* funded by LIMA Lto (Udine, Italy). "Technologies and methods for surgical navigation in knee and hip arthroplasty". P.I. G. Ferrigno - Politecnico di Milano. Ruolo: Responsabile di Workpackage (350k€).
- ***2005-2006*** *Progetto di sviluppo industriale nazionale* finanziato da DIES srl (Roma, Italia) "VIMS : An innovative system for surgical training in ophthalmic mini-invasive surgery". P.I. N.A. Borghese - Università degli Studi di Milano. Ruolo: Responsabile di Workpackage (70k€).
- ***2005-2006*** *Progetto di ricerca nazionale* HINT-Lecco finanziato da Fondazione CARIPLO. "Biomechanical models of the hand and methods for parameter estimation in the domain of Haptics " P.I. C. Frigo - Politecnico di Milano. Ruolo: participante.
- ***2002-2004*** *Progetto di sviluppo industriale nazionale* finanziato da BTS Engineering (Milano, Italy): "Model-based human motion tracking" P.I. G. Ferrigno - Politecnico di Milano. Ruolo: Responsabile tecnico e scientifico (60k€).
- ***1999-2003*** *Progetto di ricerca nazionale* finanziato da ASI (Agenzia Spaziale Italiana): "ELITE-S2": Leader: Prof. G. Ferrigno - Politecnico di Milano. Ruolo: Responsabile di Workpackage (440K€).
- ***2000–2002*** *Progetto di ricerca nazionale* finanziato da IEO – Istituto Europeo di Oncologia (Milano, Italia), "Development and implementation of new methodologies for management and analysis of

large scale micro-array genomic data. Studies of differential regulation." P.I. P.G. Pelicci – European Oncology Institute. Ruolo: Responsabile di Workpackage (75k€).

- ***1998-2000*** *Progetto di ricerca Internazionale* finanziato da National Library of Medicine, NIH . Bethesda, (MD - USA) "Visible Human Dataset". P.I. M.J. Ackerman,. Italian P.I. F. Pinciroli - Politecnico di Milano. Ruolo: participante (45k€).
- ***1998-2000*** *Progetto Nazionale* finanziato da Ministero dell'Istruzione dell'Università e della Ricerca. "Sviluppo di Agenti Software per Sistemi Informativi Sanitari" Co-P.I. F. Pinciroli - Politecnico di Milano. Ruolo: participante (110k€).
- ***1998-1999*** *Progetto di ricerca nazionale* finanziato da ASI (Agenzia Spaziale Italiana) "ELITE-S2 Phase A Feasibility study 2000 PI". P.I. G. Ferrigno - Politecnico di Milano. Ruolo: participante (125K€).
- ***1997-1999*** *Progetto di ricerca Europeo* EC Brite-EuRam Project BE96-3433 "ANNIE: Application of Neural Networks to Integrated Ergonomics," Co-P.I. Prof. G. Ferrigno - Politecnico di Milano. Ruolo: participante (2.8M€).
- ***1997-1998*** *Progetto di ricerca industriale* co-finanziato da BTS Engineering (Milano, Italia) and Centro di Bioingegneria Fondazione Don Gnocchi (Milano, Italia). "Procedure innovative di calibrazione di sistemi video per l'analisi del movimento umano" P.I. A. Pedotti - Politecnico di Milano. Ruolo: partecipante (30k€).

RESPONSABILITA' DIRETTE IN PROGETTI DI RICERCA E INDUSTRIALI

- **Responsabile Unità Operativa** Politecnico di Milano ***2012-2014*** *Progetto Nazionale* finanziato da AIRC Short-term high precision radiotherapy for early prostate cancer with concomitant boost on the dominant lesion***.***
- **Responsabile di Workpackage *2012-2014*** *National Project* funded by CNAO (Centro Nazionale di Adroterapia Ocologica). WP 2. Robotic framework.
- **Co P.I. *2010-2013*** *International Project: "CRISP - International Dual Degree in Computing, Robotics and Imaging for Surgery Platform" funded by European Commission Programme EU-US ATLANTIS PROGRAMME, COOPERATION IN HIGHER EDUCATION AND TRAINING*.
- **P.I. *2010-2012*** *National Project* funded by Ministry of Education and University: Innovative modular micro robotic instruments for transluminal endoscopic surgery".
- **P.I. *2009-2010*** *International Project funded by European Space Agency*: TEC-MMG/2009/8 "Self propelled Instrument Carrier for surgery through natural orifices".
- **Responsabile di Workpackage 2008-2010** *European Project*: FP7-ICT-2007-215190 "ROBOCAST: ROBOt and sensors integration for Computer Assisted Surgery and Therapy". WP 6: System integration.
- **P.I. 2007** *National Collaborative Research Project* funded by FSE INGENIO (Lombardia Region) "New technologies for surgical navigation".
- **Responsabile di Workpackage 2005-2006:** *National Industrial Research Project* funded by LIMA Lto (Italy) "Technologies and methods for surgical navigation in knee and hip arthroplasty". WP 2. Intraoperative software framework.
- **Responsabile di Workpackage 2005-2006** *National Industrial Development Project* funded by DIES srl (Roma, Italy) "VIMS : An innovative system for surgical training in ophthalmic mini-invasive surgery". WP 2. Camera calibration and surgical tool trajectory tracking.
- **Responsabile di Workpackage 2001-2004:** *National Research Project* funded by ASI (Italian Space Agency): "ELITE-S2 Phase A Feasibility study 2000 PI". WP 3. Camera calibration and 3D reconstruction.
- **Responsabile di Workpackage 2000-2002:** *National Research Project* IEO – Istituto Europeo di Oncologia (Milano, Italy), "Development and implementation of new methodologies for management and analysis of large scale micro-array genomic data. Studies of differential regulation". WP 3. "Data management, clustering methods and analysis.

INCARICHI ISTITUZIONALI

- membro del Collegio di Dottorato in Bioingegneria - Politecnico di Milano (2012)
- membro del Collegio di Dottorato in Bioingegneria - Politecnico di Milano (2013-2015)
- membro del Collegio del Corso di Studi in Ingegneria Biomedica, Facoltà di Ingegneria dei Sistemi - Politecnico di Milano (2004-2012)

INCARICHI DIDATTICI

- esercitatore incaricato per il corso di Fondamenti di Bioingegneria Elettronica - Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano – Docente: Prof. G. Ferrigno, Anni accademici: 2001-2002, 2002-2003, 2003-2004, 2004-2005, 2005-2006
- esercitatore incaricato per il corso di Biosensori e Microtecnologie - Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano – Docente: Prof. G. Ferrigno, Anni accademici: 2004-2005, 2005-2006, 2006-2007
- Professore a contratto nell'ambito del corso di dottorato "Tecnologie Elettroniche in Ingegneria Biomedica" della Scuola di Dottorato di Ricerca in Bioingegneria del Politecnico di Milano. Anno accademico: 2002-2003
- Professore a contratto nell'ambito del Master Universitario di II Livello "Ingegneria in Chirurgia" presso il Politecnico di Milano su principi di Chirurgia Ortopedica Assistita al Calcolatore. Anni accademici: 2005-2006, 2006-2007, 2007-2008
- Professore a contratto presso l'Accademia di Bergamo per le Scienze Avanzate - Villa ELIOS (BG), del corso Informatica di base per la Medicina. Anni accademici: 1998-1999, 1999-2000, 2000-2001
- Cicli di lezioni e esercitazioni per i corsi di Informatica Medica I, II – Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano – Docente: Prof. F. Pinciroli. Anni accademici: 1998-1999, 1999-2000;
- Cicli di lezioni per il corso di Sistemi Intelligenti Naturali e Artificiali, Facoltà di Ingegneria dei Sistemi (II) - Politecnico di Milano – Docente: Prof. G. Ferrigno. Anni accademici: 2001-2002, 2002-2003.
- Cicli di lezioni per il corso "Sistemi intelligenti" con argomento: "Computazione evoluzionistica". Docente Prof. N.A. Borghese, Università degli Studi di Milano. Anno accademico: 2005-2006.

INCARICHI DI RICERCA

- (09/1996 - 09/1997) Istituto di Neuroscienze e Bioimmagini del CNR di Milano nell'ambito del progetto: "Ricostruzione tridimensionale automatica del movimento umano da sistema video a stereo camera". Riferimento: Dr. Alberto Borghese;
- (09/1997 - 09/1998) Centro di Bioingegneria della Fondazione Don Gnocchi di Milano e del Politecnico di Milano nell'ambito del progetto: 'Nuove metodologie e implementazione di un sistema automatico per la calibrazione di un sistema video per la cattura del movimento umano in tre dimensioni'. Riferimento: Prof. Antonio Pedotti;
- (09/1999 a 10/1999) National Library of Medicine del National Institute of Health a Bethesda MD, USA nell'ambito del progetto Visible Human Project finanziato dal National Institute of Health, USA. Riferimento: Dr. Micheal Ackermann;
- (09/2000 – 09/2001) Istituto Europeo di Oncologia (IEO) nell'ambito del progetto "Sviluppo e implementazione di metodologie di gestione e analisi di dati di espressione genomica ottenuti da macro/micro arrays. Studi sulla regolazione differenziale; Riferimento: Pier Giuseppe Pelicci;
- (09/2001 – 09/2002) Dipartimento di Bioingegneria del Politecnico di Milano nell'ambito del progetto ELITE-S2 "Metodologie e tecnologie per l'acquisizione in 3D del movimento umano in microgravità" finanziato da ASI (Agenzia Spaziale Italiana). Riferimento: Prof. Giancarlo Ferrigno;
- (06/2005 – 12/2006) Dipartimento di Scienze dell'Informazione – Università degli Studi di Milano nell'ambito del Progetto VIMS "Sviluppo di un sistema per il training in microchirurgia oftalmica". Riferimento: Prof. Alberto Borghese;
- (01/2012 – 12/2013) Centro Nazionale di Adroterapia Oncologica nell'ambito del progetto "Sistema di Imaging robotico in sala di trattamento adroterapico" Riferimento: Presidente CNAO Dr. Eugenio Borloni.

CONSULENZE PROFESSIONALI

- (07/2000 - 8/2000) Electronic Arts Canada di Vancouver (British Columbia, Canada) nell'ambito delle attività riguardanti l'animazione di caratteri virtuali a partire dalla misura di movimenti umani. Riferimento: Pauline Moller;
- (01/2004 - 01/2005) Netcont srl (Milano) nell'ambito del progetto "Implementazione di servizi WEB per la contabilità on-line". Riferimento: Dr. Stefano Inzoli;
- (01/2005 - 06/2005) Valtechnic SNC e Rally-art Mitsubishi-Italia nell'ambito del progetto "Studio di fattibilità di un sistema di monitoraggio dell'attività dinamica di auto da rally tramite sensoristica specifica". Riferimento: Fabio Merazzi;
- (11/2005 - 02/2006) DS Medica (Milano), società del Gruppo DS MediGroup, nell'ambito del Progetto "Applicazione di modelli tridimensionali del corpo umano nel campo dell'ispezione dermatologica". Riferimento: Livio Campari;

ATTIVITA' DI REVISIONE SCIENTIFICA DI PROGETTI E PUBBLICAZIONI

- (06/2009 - 07/2009) Esperto valutatore invitato da EU ICT for Health, under Call 4 of the Information and Communication Technologies Theme of FP7. Call Objective ICT-2009.5.2: Patient Safety (PS).
- (11/2011 - 01/2012) Esperto valutatore invitato da Natural Sciences and Engineering Research Council of Canada. Collaborative Health Research Projects Selection Panel NSERC/CRSNG.
- revisore per le seguenti riviste internazionali:

Annals of Biomedical Engineering, IEEE Transaction on Pattern Analysis and Machine Intelligence, Medical Physics, Medical & Biological Engineering & Computing, Journal of Neuroscience Methods, Clinical Biomechanics, Computer Methods in Bioengineering and Biomechanics; Medical Engineering and Physics, Computers in Biology and Medicine, International Journal of Medical Robotics and Computer Assisted Surgery, Sport Biomechanics, Journal of Biomechanics.

PREMI E INVITI

2012

- Oratore invitato a Robotica – The International Humanoid and Service Robots Expo, Milano 7-8 Novembre 2012. "Robotics between research and clinical application: the experience of CART-CAS laboratory of the Politecnico di Milano".

2010

- Professore invitato nel post graduation course "Fundamentos e Métodos Quantitativos para Biomecânica" at University of Campinas (Brazil) finanziato by FUNCAMP foundation. Titolo: "Methods and technologies in Sport Science".
- Oratore invitato in the Symposium of Science and Technologies in Sport - University of Campinas (Brazil).
- Oratore invitato presso European Space Agency ESA-ESTEC Keplerlaan 1, 2200AG Noordwijk ZH, The Netherlands. Titolo: "Innovative surgical robotics for natural-orifice transluminal endoscopic surgery: perspectives for space applications".
- Membro invitato del Comitato "The Hamlyn Symposium on Medical Robotics" The Royal Society of Science in London (UK).

2008

- Premio "Migliore Innovazione" a K-Idea – Scientific technological park *Kilometro Rosso. Robotic technologies for the vision in mini-invasive transluminal endoscopic surgery.* Bergamo (Italia).

2006

- Professore invitato presso Università degli Studi di Milano (Italia). Titolo: " Evolutionary computation" .

2003

- Professore invitato University of Campinas (Brazil). Titolo: "Biomechanics and Sport Science".
- Professore invitato European School Marseille, (France) Titolo: "Technologies and new methods for human motion analysis" .

SUPERVISIONE DI CANDIDATI DOTTORATO DI RICERCA E POST-DOC

Linea di ricerca: *Biomeccanica del movimento*

- Amanda Piaia Silvatti – PhD student in Physical Education (Campinas University, Brasile) finanziata da FAPESP (Brasile). Stage at Politecnico di Milano (2010-2011) supported by CAPES foundation (Brasile).
- Nicola Lopomo - Dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da Istituti Ortopedici Rizzoli (Bologna, Italia)
- Emiliano Gambaretto - Dottorato di ricerca in Bioingegneria (Politecnico di Milano)

Linea di ricerca: *Immagini biomediche, chirurgia assitita al Computer, radioterapia, robotica medica*

- Joseph Stancanello – Dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da Ospedale San Bortolo (Vicenza, Italia).
- Marialuisa Mandelli - Dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da Istituto neurologico Besta (Milano, Italia).
- Paolo Patete – Post doc finanziato da EON medica (Italia).
- Matteo Seregni – candidato Dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da MIUR.
- Aurora Fassi - candidata Dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da MIUR
- Cynthia Zazzarini – Assegnista di ricerca finanziato da MIUR.
- Andrea Pella – Post doc finanziato da CNAO (Pavia, Italia).
- Antonella Belfatto – candidata dottorato di ricerca in Bioingegneria (Politecnico di Milano) finanziato da MIUR.

ATTIVITA' DI RICERCA SCIENTIFICA

Pietro Cerveri's scientific research activity has spanned *machine vision*, *biomechanics*, *medical image processing*, *medical informatics*, *computer assisted surgery* and *medical robotics*. He has carried out both innovative basic and applicative researches mainly in bioengineering and biomedical fields collaborating with engineers, mathematicians, surgeons, biologists and physicians. The results were proved by more than 50 papers, published in peer-reviewed journals. He carried out research in a small-size mono-discilpinary team and in greater multi-disciplinary groups as well. Since 1998 he has been participating in different national and international research project and national industrial project in quality of WP participant, WP responsible and principal investigator.

MACHINE VISION: in this scientific area, Pietro Cerveri started its activity by coping with the calibration of multi-camera systems and dealt with methods and technologies for object and human motion real-time tracking. He conceived innovative methods for camera calibration based on Evolutionary Computation validated across different motion capture systems. He developed calibration and tracking applications that were acquired by an Italian Company in the field (BTS Engineering, Milano – Italy). The related scientific aspects were object of publication in ISI peer-review international journals of the biomechanical community. In particular, the innovative evolutionary approach was published in the most relevant scientific journal (IEEE Transaction on Evolutionary Computation) in the area of evolutionary computation. Due to his skills in this field of research he collaborated to different research and industrial projects: **a**) in July-August 2000 he was recruited by Electronic Arts Canada in Vancouver (British Columbia, Canada) as a software engineer to collaborate to a project for the development of automatic algorithm for camera calibration of multi-camera system (20 cameras); **b**) since 1999 to 2004 he was involved in the project "ELITE-S2" funded by Italian Space Agency (ASI) where he was responsible of Workpackage 3 "System calibration". The project consisted in the development of a new motion capture platform for acquisition of astronaut movements in microgravity conditions (physiological motion adaptation to microgravity); **c**) since 2005 to 2006, he was involved in a national industrial project funded by DIES srl (Roma, Italy), named "VIMS : An innovative system for surgical training in ophthalmic mini-invasive surgery", as responsible of the Workpackage 2 "Camera calibration and tip tracking".

BIOMECHANICS AREA: in this scientific area, Pietro Cerveri coped with the problem of the human kinematic estimation from surface markers for clinical and sport applications. Starting from the development of full body kinematic models, he focused its investigation on the analysis of anatomical subparts as the spine, the lower limb and the hand. He developed method to the estimation of kinematic parameters (centers and axes of rotation), he faced the problem of reduction of the effect of soft tissue artifacts and developed innovative algorithm based on state-space filters and neural networks for the simulation of human-like trajectories, and volume capture for the motion analysis without surface markers. The results of such activities were extensively published in ISI peer-review international journals. The corresponding papers now constitute the state-of-the art for motion estimation techniques. Since 2005-2006, he participated to a project in cooperation with by Biomotion Laboratory-Mechanical Engineering Department – Stanford University, Stanford, CA (USA) named "Markerless Motion Capture". At present time, he is involved in a project co-funded by Nuclear Medicine Department and CERMAC - San Raffaele Scientific Institute aiming at using MRI-based bone surface models to analysis the kinematics of hand and finger joints. He is now a participant in National Project funded by Ministry of Education, University and Research. "Biomechatronic hand prostheses endowed with bio-inspired tactile perception, bi-directional neural interfaces and distributed sensori-motor control" (2013-2015).

MEDICAL INFORMATICS AREA: in this scientific area, the research activity of Pietro Cerveri can be split in two main subjects: knowledge representation and bioinformatics. As far as the knowledge representation is concerned, he spent he doctoral period dealing with the problem of symbolic anatomical knowledge representation and the integration of such information with the visual information coming from image (histological, morphological) data. His doctoral program was co-funded by the National Library of Medicine, National Institute of Health in Bethesda (MD - USA) under the "Visible Human Dataset" (the greatest digital archive in the world of histological images of a human cadaver) project. He investigated semantic networks

and database technology as infrastructure for representing and coding symbolic information. He focused his research on conceptual classification, ontology and digital medical vocabularies as UMLS and SNOMED to cite few. He developed a software framework for joining visual and symbolic anatomical information by allowing an interactive querying of digital images. The results of the doctoral period were published in ISI peer-review international specialized journals.
In the bioinformatics field, Pietro Cerveri dealt with the management and the analysis of human genetic data (genomic differential expression data) coming from micro, gene-chips, oligonucleotides arrays. He collaborated to a project funded by IEO – European Institute of Oncology (Milano, Italy), called "Development and implementation of new methodologies for management and analysis of large scale micro-array genomic data. Studies of differential regulation" aiming at developing a SW platform for the management and analysis of large scale micro-array data of differential gene expression. In particular, he was responsible of the Workpackage 3 "Data management, clustering methods and analysis". He developed automatic procedures for managing huge amount of genomic data (5-25GB every study), algorithms for intra-inter experiment calibration, for data clustering and statistical analysis of differential genomic expression and co-expression. The results of this research activity were published in ISI peer-review international specialized journals.

MEDICAL IMAGE PROCESSING, COMPUTER AIDED SURGERY, RADIOTERAPHY AND MEDICAL ROBOTICS: in this broad scientific area, Pietro Cerveri dealt with medical image processing, - segmentation, fluoroscopic image rectification, multi-modal volume registration (CT-MR, CT-ANGIO) - for planning of the radio-surgery treatment through the Cyberknife. He extensively collaborated with San Bortolo Hospital in Vicenza (Italy) and Department of Neurosurgery, Neuromed IRCCS, 86077 Isernia (Italy). Particularly, he contributed to the development and validation of methods for registration (rigid and non-rigid) based on the mutual information paradigm. The work focused the automatic identification in the images of organs at morphological and functional risk. He is co-author of a number of publications on the subject in ISI peer-review international journals in the realm of medical physics. In computer aided surgery scientific area, the research activity of Pietro Cerveri focused formerly on Orthopaedics. In particular, he dealt with navigation for knee and hip surgery. He developed registration algorithms based on bone-morphing, method to compute intra-operatively the limb mechanics starting from measurements of points or areas on the bone surfaces, automatic methods to computed the optimal positioning and size of the prosthesis, method for real-time visualization. From 2005 to 2006 he was involved in an Industrial Research project funded by Lima lto (Udine, Italy) named "Technologies and methods for surgical navigation in knee and hip arthroplasty". He was responsible of the Workpackage 5 "Intra-operative software module". His activity in this field evolved as he moved to the design and development of intra-operative monitoring devices that leaded to a number of patents. In 2007, he was leader of the *Collaborative Research Project* funded by FSE INGENIO (Lombardia Region) "New technologies for surgical navigation" where he investigated different technologies for surgical navigation. Since 2007, he has been participating to the *National project* funded by Politecnico di Milano and Politecnico di Torino "ORTHOROB, ORTHOpaedic Surgery and ROBotics" (2007-2009) in quality of responsible of Workpackage 2 "Robot interface". Since January 2008, he has been participating in the *European Project*: FP7-ICT-2007-215190 "ROBOCAST: ROBOt and sensors integration for Computer Assisted Surgery and Therapy" (2008-2010) in quality of responsible of workpackage 6 "System interface". Along this direction, in early 2010 he started a research activity in collaboration with Niguarda hospital in Milano (Italy) with the goal of developing innovative robotic technologies for abdominal surgery. In this domain, Pietro Cerveri was principal investigator of two projects, namely "Self propelled Instrument Carrier for surgery through natural orifices", concerning a feasibility study on robotics for surgery in microgravity funded by the European Space Agency (2009-2010) and "Innovative modular micro robotic instruments for transluminal endoscopic surgery" (2010-2012) funded Italian Ministry of Education, University and Research. In the field of radiotherapy, He was recently started a collaboration with Centro nazionale di Adroterapia Oncologica and he was included in three main projects: "Robotic imaging system for hadron-therapy room" (2012-2013), "ULICE (Union of Light Ion Centers in Europe, FP7-INFRA-2008-1.1.2) (2010-2013) and "ENVISION - European NoVel Imaging Systems for ION therapy" (2010-2013). In the first project, he was responsible of the WP 2. Robotic framework to manage the feasibility analysis, the robot selection, room setup, robot programming and safety measures. Within ULICE, he is currently

cooperating in the development of innovative strategies for real-time tumor tracking in hadron-therapy using artificial neural networks. Within Envision, he is currently cooperating in the development of a HW/SW framework for real-time steering of the particle beam in hadron-therapy to cope with tumor localization uncertainty.

BIBLIOGRAFIA

Riviste Internazionali

1. **Cerveri P.**, Manzotti A., Vanzulli A., Baroni G., Local shape similarity and mean-shift curvature for deformable surface mapping of anatomical structures, IEEE Trans Biomed Eng. 2013. ISSN 0018-9294.
2. Seregni M., Kaderka R., Fattori G., Riboldi M., Pella A., Constantinescu A., Saito N., Durante M., **Cerveri P.**, Bert C., Baroni G., Tumor tracking based on correlation models in scanned ion beam therapy: an experimental study., Phys Med Biol. 58(13):4659-78, 2013. ISSN 0031-9155.
3. Zazzarini C., Patete P., Baroni G., **Cerveri P.**, Mechatronic design of a fully-integrated camera for mini-invasive surgery. IEEE Trans Biomed Eng. 60(6):1538-45, 2013. ISSN 0018-9294.
4. Seregni M., Pella A., Riboldi M., Orecchia R., **Cerveri P.**, Baroni G., Real-time tumor tracking with an artificial neural networks-based method: A feasibility study. Phys Med. Jan;29(1):48-59, 2013. ISSN: 1120-1797.
5. **Cerveri P.**, Manzotti A., Baroni G., Patient-specific acetabular shape modeling: comparison among sphere, elliptical and conchoid parameterizations, Comput Methods Biomech Biomed Engin., 2012; ISSN: 1025-5842.
6. Seregni M., **Cerveri P.**, Riboldi M., Pella A., Baroni G., Robustness of external/internal correlation models for real-time tumor tracking to breathing motion variations. Phys Med Biol., 57(21):7053-7074, 2012. ISSN 0031-9155.
7. Confalonieri N., Chemello C., **Cerveri P.**, Manzotti A., Is computer-assisted total knee replacement for beginners or experts? Prospective study among three groups of patients treated by surgeons with different levels of experience. J Orthop Traumatol. 13(4):203-10, 2012. ISSN: 1590-9921.
8. Manzotti A., Chemello C., Pullen C., **Cerveri P.**, Confalonieri N., Post traumatic knee arthritis following femoral fracture: navigated total knee replacement with retention of hardware, The Knee, 2012. ISSN: 0968-0160.
9. Manzotti A., Chemello C., Pullen C., **Cerveri P.**, Confalonieri N., An uncommon cause of cemented unicompartimental knee arthroplasty failure: fracture of metallic components, Knee Surgery Sports Traumatology Arthroscopy, 2012. ISSN: 0942-2056.
10. Manzotti A., Chemello C., Pullen C., **Cerveri P.**, Confalonieri N., Computer-assisted total knee arthroplasty following prior femoral fracture without hardware removal. Orthopedics, 35(10):34-39, 2012. ISSN: 0147-7447.
11. Silvatti A.P., Sarro K.J., **Cerveri P.**, Baroni G., Barros R.M.L., A 3D kinematic analysis of breathing patterns in competitive swimmers, Journal of Sport Sciences, 30(14): 1551-60, 2012. ISSN: 0264-0414.
12. Silvatti A.P., **Cerveri P.**, Telles T., Dias F.A.S., Baroni G., Barros R.M.L., Quantitative underwater 3D motion analysis using submerged video cameras: accuracy analysis and trajectory reconstruction, Comput Methods Biomech Biomed Engin. 45:2012; ISSN: 1025-5842.
13. **Cerveri P.**, Manzotti A., Marchente M. Confalonieri N., Baroni G., Mean-shifted surface curvature algorithm for automatic bone shape segmentation in orthopedic surgery planning: a sensitivity analysis. Computer Aided Surgery., 17(3):128-41, 2012. ISSN: 1092-9088.
14. Silvatti A.P., Dias F.A.S., **Cerveri P.**, Barros R.M.L., Comparison of different camera calibration approaches for underwater applications. J Biomech. 45:1112-16, 2012. ISSN 0021-9290.
15. Schaerer J., Fassi A., Riboldi M., **Cerveri P.**, Baroni G., Sarrut D,. Multi-dimensional respiratory motion tracking from markerless optical surface imaging based on deformable mesh registration. Phys Med Biol. 57(2):357-73, 2012. ISSN 0031-9155.

16. **Cerveri P.**, Marchente M., Chemello C., Manzotti A., Confalonieri N., Baroni G., Advanced computational framework for the automatic analysis of the acetabular morphology from the pelvic bone surface for hip arthroplasty applications, Ann Biomed Eng. 39(11):2791-806, 2011. ISSN: 0090-6964.
17. Aliverti A., Frigo C., Andreoni G., Baroni G., Bonarini A, **Cerveri P.**, Crivellini M, Dellaca R, Ferrigno G, Galli M, Pedrocchi A., Rodano R., Santambrogio G.C., Tognola G., Pedotti A., Functional evaluation and rehabilitation engineering. IEEE Pulse. 2011 May-Jun;2(3):24-34.
18. **Cerveri P.**, Sarro K.J., Marchente M., Barros R., Isomap transform for segmenting human body shapes. Comput Methods Biomech Biomed Engin. 14(9):783-95, 2011. ISSN: 1025-5842
19. Manzotti A., **Cerveri P.**, De Momi E., Pullen C., Confalonieri N. Does computer-assisted surgery benefit leg length restoration in total hip replacement? Navigation versus conventional freehand. Int Orthop. 35(1):19-24, 2011. ISSN: 0341-2695.
20. Lodovico A. **Cerveri P.**, Ferrigno G., Barros R. A novel video-based method using projected light to measure trunk volumes during respiration. Comput Methods Biomech Biomed Engin. 2011; 14(8):707-713. ISSN: 1025-5842.
21. **Cerveri P.**, Marchente M., Manzotti A., Confalonieri N., Determination of the Whiteside line on the femur surface model by fitting high-order polynomial functions to the cross-section profiles of the intercondylar fossa, Computer Aided Surgery. 16(2):71-85, 2011. ISSN: 1092-9088.
22. Cammarata S., Cammarata M., Lopomo N., Bignozzi S., **Cerveri P.**, Ferrigno G., Zaffagnini S., Visani A., Accuracy characterization of an integrated optical-based method for loads measurements in computer aided surgery. Journal of Mechanics in Medicine and Biology, 2010;10(4):577-591. ISSN: 0219-5194.
23. Confalonieri N., Manzotti A., Chemello C., **Cerveri P.**, Computer-assisted revision of failed unicompartimental knee arthroplasty. Orthopedics, 33(10):52-57, 2010. ISSN: 0147-7447.
24. **Cerveri P.**, Marchente M., Bartels W., Corten K., Simon J.P., Manzotti A., Towards automatic computer-aided knee surgery by innovative methods for processing the femur surface model. Int. Journal of Medical Robotics and Computer Assisted Surgery, 6(3):350-361, 2010. ISSN: 1478-5951.
25. **Cerveri P.**, Marchente M., Bartels W., Corten K., Simon J.P., Manzotti A., Automated method for computing the morphological and clinical parameters of the proximal femur using heuristic modeling techniques. Ann Biomed Eng. 38(5):1752-66, 2010. ISSN: 0090-6964.
26. Manzotti A., **Cerveri P.**, De Momi E., Pullen C., Confalonieri N. Relationship between cutting errors and learning curve in computer-assisted total knee replacement. Int Orthop. 34(5):655-62, 2010. ISSN: 0341-2695.
27. **Cerveri P.**, De Momi E, Marchente M, Baud-Bovy G, Scifo P, Barros RM, Ferrigno G., Method for the estimation of a double hinge kinematic model for the trapeziometacarpal joint using MR imaging. Comput Methods Biomech Biomed Engin. 13(3):387-396, 2010. ISSN: 1025-5842.
28. De Momi E., Lopomo N., **Cerveri P.**, Zaffagnini S., Safran M.R., Ferrigno G., In-vitro experimental assessment of a new robust algorithm for hip joint centre estimation. J Biomech. 29;42(8):989-95, 2009. ISSN 0021-9290.
29. Confalonieri N., Manzotti A., **Cerveri P.**, De Momi E., Bi-Unicompartmental versus Total Knee Arthroplasty: a Matched Paired Study with early clinical results. Arch Orthop Trauma Surg. 129(9):1157-63, 2009. ISSN: 0936-8051.
30. De Momi E., **Cerveri P.**, Gambaretto E., Marchente M., Effretti O., Barbariga S. Gini G., Ferrigno G., Robotic alignment of femoral cutting mask during total knee arthroplasty. International Journal of Computed Assisted Radiology and Surgery. 3(5):413-19, 2008. ISSN: 1861-6410.
31. Stancanello J., Muacevic, A., Sebastiano F., Modugno N., **Cerveri P.**, Ferrigno G., Uggeri F., Cantore G., Romanelli P., 3T MRI evaluation of the accuracy of atlas-based subthalamic nucleus identification, Medical Physics, 35(7):3069-77, 2008. ISSN: 0094-2405.

32. **Cerveri P.**, De Momi E., Marchente M., Lopomo N., Baud-Bovy G., Barros R. M. L., Ferrigno G., In-vivo validation of a realistic kinematic model for the trapezio-metacarpal joint using an optoelectronic system. Annals of Biomedical Engineering, 36(7):1268-80, 2008. ISSN: 0090-6964.
33. Stancanello J., Romanelli P., Sebastiano F., Modugno N., Muacevic, A., **Cerveri P.**, Esposito V., Ferrigno G., Uggeri F., Cantore G., Direct validation of atlas-based red nucleus identification for functional radiosurgery, Medical Physics, 34(8):3143-48, 2007. ISSN: 0094-2405.
34. **Cerveri P.**, De Momi E., Lopomo N., Baud-Bovy G., Barros R. M. L., Ferrigno G., Finger kinematic modeling and real-time hand motion estimation. Annals of Biomedical Engineering, 35(11):1989-2002, 2007. ISSN: 0090-6964.
35. Stancanello J., Cavedon C., Francescon C., Causin F., Colombo F., **Cerveri P.**, Ferrigno G., Uggeri F., Bold FMRI integration into radiosurgery treatment planning of cerebral vascular malformations, Medical Physics, 34(4):1176-1184, 2007. ISSN: 0094-2405.
36. Stancanello J., Cavedon C., Francescon C., Avanzo M., Causin F., Colombo F., **Cerveri P.**, Ferrigno G., From Morphological To Functional Definition Of Organs At Risk: The Role Of Fmri In Radiosurgery, Int. J. Sci. Res., 16:15-21, 2006. ISSN 1992-884X.
37. Stancanello J., Romanelli P. Modugno N., **Cerveri P.**, Ferrigno G, Uggeri F.,Cantore G., Atlas-based identification of targets for functional radiosurgery, Medical Physics 33(6):1603-16, 2006. ISSN: 0094-2405.
38. **Cerveri P.** Pedotti A., Ferrigno G., Kinematical models to reduce the effect of skin artefacts on marker-based human motion estimation, Journal of Biomechanics, 38(11):2228-2236, 2005. ISSN: 0021-9290.
39. **Cerveri P.**, Lopomo N., Pedotti A., Ferrigno G., Derivation of centers and axes of rotation for wrist and fingers in a hand kinematic model: robust methods and reliability results, Annals of Biomedical Engineering, 33(3):402-12, 2005. ISSN: 0090-6964.
40. Stancanello J., Cavedon C., Francescon C., **Cerveri P.**, Ferrigno G., Colombo F., Perini S., CT – 3D Rotational Angiography registration using mutual information: a sensitivity analysis. Medical & Biological & Engineering Computing, 43:667-671, 2005. ISSN: 0140-0118.
41. Stancanello J., Berna E., Cavedon C., Francescon P., Loeckx D., **Cerveri P.**, Ferrigno G., Baselli G., Preliminary study on the use of non-rigid registration for target tracking and dynamic treatment planning, Medical Physics 32(12):3777-3785, 2005. ISSN: 0094-2405.
42. **Cerveri P.**, Pedotti A., Ferrigno G., Non-invasive approach toward the in vivo estimation of 3D inter-vertebral movements: methods and preliminary results, Medical Engineering & Physics, 26(10):841-853, 2004. ISSN: 1350-4533.
43. Stancanello J., Cavedon C., Francescon C., Colombo F., Casentini L., **Cerveri P.**, Ferrigno G. Development and validation of a CT - 3D rotational angiography registration method for AVM radiosurgery, Medical Physics, 31(6):1363-1371, 2004. ISSN: 0094-2405.
44. **Cerveri P.**, Pedotti A., Ferrigno G., Evolutionary optimization for robust hierarchical computation of the rotation centres of kinematical chains from reduced ranges of motion: the lower spine case. Journal of Biomechanics, 37(12):1881-1890, 2004. ISSN: 0021-9290.
45. Masseroli M., **Cerveri P.**, Pelicci P.G., Pinciroli F., Alcalay M., Gene Array Analyzer Software: a multi-user platform for management, analysis and visualization of gene expression data from replicate experiments. Minerva Biotecnologica 15(4):207-216, 2003. ISSN: 1120-4826.
46. **Cerveri P.**, Boninsegna D., Ceccarelli L., Lefort L., Pedotti A. ,Ferrigno G., Kinematical modeling and extended Kalman filters for robust human motion estimation, Brazilian Journal of Biomechanics, 4(6):5-15, 2003. ISSN 1518-8191.
47. Masseroli M., **Cerveri P.**, Pelicci P.G., Alcalay M., GAAS: Gene Array Analyzer Software. A framework for

management, analysis and visualization of gene expression data, Bioinformatics, 19(6):774-5, 2003. ISSN 1367-4803.

48. **Cerveri P.**, Pedotti A., Ferrigno G., Robust recovery of human motion from video using Kalman filters and virtual humans, Human Movement Science, 22(3):377-404, 2003. ISSN: 0167-9457.
49. **Cerveri P.**, Forlani C., Pedotti A., Ferrigno G., HRBF networks and local polynomial un-warping for XRII distortion correction. A comparison to global techniques, Medical & Biological & Engineering Computing, 41(2):151-163, 2003. ISSN: 0140-0118.
50. **Cerveri P.**, Rabuffetti M., Pedotti A., Ferrigno G., Real-time human motion estimation through biomechanical models and non-linear state-space filters, Medical & Biological & Engineering Computing, 41(6):109-123, 2003. ISSN: 0140-0118.
51. **Cerveri P.**, Forlani C., Borghese N.A., Ferrigno G, Distortion correction for X-ray image intensifiers: local un-warping polynomials and RBF neural networks, Medical Physics, 29(8):1759-1771, 2002. ISSN: 0094-2405.
52. **Cerveri P.**, Pedotti A., Borghese N.A., Combined evolution strategies for dynamic calibration of video based measurement systems, IEEE Transaction on Evolutionary Computation, 5(3):271–282, 2001. ISSN:1089-778X.
53. Rigotti C., **Cerveri P.**, Andreoni G., Pedotti A., Ferrigno G., Modeling and driving of a reduced human mannequin through motion captured data: a neural network approach, IEEE Transaction on System, Man and Cybernetics Part A, 31(3):187-193, 2001. ISSN:1083-4427.
54. **Cerveri P.**, Pinciroli F., Symbolic representation of anatomical knowledge: concept classification and development strategies, Journal of Biomedical Informatics, 34:321-347, 2001. ISSN: 1532-0464.
55. Borghese N.A., **Cerveri P.**, Rigiroli P. A fast method for calibrating video-based motion analysers using only a rigid bar. Medical & Biological Engineering & Computing, 39(1):76-81, 2001. ISSN: 0140-0118.
56. **Cerveri P.**, Masseroli M., Pinciroli F., Remote access to anatomical information: an integration between semantic knowledge and visual data. Journal of the American Medical Informatics Association, pp**.** 126-130 Supplement**:** Suppl. S**,** 2000. ISSN: 1067-5027.
57. Borghese N.A., **Cerveri P.**, Calibrating a video camera pair with a rigid bar, Pattern Recognition, 33:81-95, 2000. ISSN: 0031-3203.
58. **Cerveri P.**, Borghese N.A., Ferrigno G., Evolution strategies and epipolar geometry for dynamic calibration of a photogrammetric camera system, Medical & Biological Engineering & Computing, 37(2):830-831, 1999. ISSN: 0140-0118.
59. **Cerveri P.**, Borghese N.A., Pedotti A., Complete calibration of a stereo photogrammetric system through control points of unknown coordinates, Journal of Biomechanics, 31(10):935-940, 1998. ISSN: 0021-9290.
60. Borghese N.A., **Cerveri P.**, Ferrigno G., Statistical comparison of DLT versus ILSSC in the calibration of a photogrammetric stereo-system, Journal of Biomechanics, 30(4):409-413, 1997. ISSN: 0021-9290.

International conferences

61. Fattori G., Saito N., Pella A., Kaderka R., Seregni M., Constantinescu A., **Cerveri P.**, Steidl P., Riboldi M., Baroni G., Bert C., TU-A-BRA-08: Integration of Optical Tracking for Organ Motion Compensation in Scanned Ion-Beam Therapy. Medical Physics. 2012 Jun;39(6):3889. ISSN: 0094-2405.
62. Silvatti, A.P., Telles, T., Dias, F.A.S, **Cerveri P.**, Barros, R.M.L. (2011) Underwater comparison of wand and 2d plane nonlinear camera calibration methods. Proceedings of 29th International Conference on Biomechanics in Sport, Porto, Portugal. p. 937-940.
63. Zazzarini C.C., Pansini A., Zaltieri R., Forgione A., Pugliese R., **Cerveri P.**, Design of a robotic endoscope for mini invasive surgery, Proceedings of the ASME 2011 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, DETC2011-47445 pp. 771-777**,** IDETC/CIE 2011 August 29-31, 2011, Washington, DC, USA.
64. Silvatti, A.P., Telles, T., **Cerveri P.**, Barros, R.M.L. (2011) Underwater arm stroke motion analysis: comparison of theoretical model and experimental data. 16th *Congress of the European College of Sport Science*, Liverpool, London.
65. Zoppi M., Molfino R., **Cerveri P.**, Modular micro robotic instruments for transluminal endoscopic robotic surgery: new perspectives Proceedings of 2010 IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications, MESA 2010 , art. no. 5551996, pp. 440-445.
66. De Momi E, **Cerveri P**, Ferrigno G., ROBOt and sensors integration for Computer Assisted Surgery and Therapy (ICT-2007-215190-ROBOCAST), ICAR: 2009 14TH INTERNATIONAL CONFERENCE ON ADVANCED ROBOTICS, VOLS 1 AND 2 pp: 899-904, 2009.
67. De Lorenzo, D., De Momi, E., Beretta, E., Cerveri, P., Perona, F., Ferrigno, G. Experimental validation of A-mode ultrasound acquisition system for computer assisted orthopaedic surgery, *Progress in Biomedical Optics and Imaging - Proceedings of SPIE* 7265, art. no. 726502, 2009.
68. De Momi E., **Cerveri P.**, Gambaretto E., Marchente M., Effretti O., Barbariga S., Gini G., Ferrigno G. (2008) Robotic alignement of femoral cutting mask during total knee arthroplasty. Int. J CARS, 3, S120-S121
69. Gambaretto E., **Cerveri P.**, De Momi E., Ferrigno G. (2008) A new method for the intraoperative measurement of the femoral anteversion angle during total hip arthroplasty procedures. Int. J CARS, 3, S94-S95.
70. Anselmi L., Canina M., **Cerveri P.**, Lopomo N., Marcacci M., Ergonomic Evaluation Methods On Computer Aided Surgery - Preliminary Design. In: 8th Annual Meeting of CAOS-International, International Society for Computer Orthopedic Assisted, Hong Kong, 4-7 June, 2008, p. 323-326.
71. Anselmi L., Canina M., **Cerveri P.**, Lopomo N., Marcacci M., (2008). SU¢CEDE - SUrgeon CEntre DEsign: Ergonomic Evaluation Methods on Computer Aided Surgery. In: HEPS International Conference 2008 - “Healthcare Systems Ergonomics and Patient Safety". Palais des Congrès Strasbourg, France, 25-28 June, 2008, p. 250-256.
72. Stancanello J., Romanelli P., Modugno N., **Cerveri P.**, Ferrigno G., Uggeri F., Cantore G., Atlas Based Identification of Targets for Functional Radiosurgery. WORLD CONGRESS ON MEDICAL PHYSICS AND BIOMEDICAL ENGINEERING 2006, VOL 14, PTS 1-6 Book Series: IFMBE Proceedings Volume: 14 Pages: 3126-3129 Part: Part 1-6 Published: 2007.
73. S. Bruni, **Cerveri P.**, Espinoza I., An Application of an Hybrid Robot in the Total Knee Replacement Procedure, 12th IFToMM World Congress, Besançon (France), 2007.
74. **Cerveri P.**, Gambaretto E., De Momi E., Ferrigno G., Multimodal graphic interface for total knee and hip arthroplasty. In Computer Assisted Orthopaedic Surgery, ed. By F. Langlotz, B.L. Davies, P.A. Grutzner, pub. By Pro Business GmbH, Berlin, ISBN 978-3-939430-46-9, pp. 654-656, 2007.

75. De Momi E., **Cerveri P.**, Gambaretto E., Audrito M., Facchini A., Ferrigno G., Novel method for intra-operative computation of the femoral neck anteversion angle. In Computer Assisted Orthopaedic Surgery, ed. By F. Langlotz, B.L. Davies, P.A. Grutzner, pub. By Pro Business GmbH, Berlin, ISBN 978-3-939430-46-9, pp. 501-503, 2007.
76. Bovio D., De Momi E., Forlani C., **Cerveri P.**, Ferrigno G., Audrito M., Facchini A., Dellacà R., 3D freehand ultrasound-based bone modeling for total knee replacement. In Computer Assisted Orthopaedic Surgery, ed. By F. Langlotz, B.L. Davies, P.A. Grutzner, pub. By Pro Business GmbH, Berlin, ISBN 978-3-939430-46-9, pp. 361-363, 2007.
77. De Momi E., **Cerveri P.**, Audrito M., Facchini A., Ferrigno G., 3D shape iterative reconstruction method based on statistical models, Proceedings of 6th Computer Assisted Orthopaedic Surgery, pp. 123-126, 2006.
78. De Momi E., **Cerveri P.**, Audrito M., Facchini A., Ferrigno G., A new Algorithm for hip joint center computation in TKR, Proceedings of 6th Computer Assisted Orthopaedic Surgery, pp. 119-122, 2006.
79. **Cerveri P.**, De Momi E., Lopomo N., Baud-Bovy G., Pajardi P., Ferrigno G., In-vivo estimation of the kinematic parameters of the trapezio-metacarpal joint using surface markers, 5th World Congress of Biomechanics, July 29 - August 4, 2006, Munich (Eds. Wiley-VCH).
80. Stancanello J., Cavedon C., Francescon P., Berna E., Loeckx D., **Cerveri P.**, Ferrigno G., Non-Rigid Registration for Target Tracking and Dynamic Treatment Planning: an Analysis of Feasibility on Five Patients, IEEE Nuclear Science Symposium and Medical Imaging Conference, Puerto Rico, US, 23-29 October 2005.
81. Marchesetti D., Rutigliano N., Barros R. M. L., Pedotti A., Ferrigno G., **Cerveri P.**, Markerless human motion capture: methods and preliminary results. IFMBE MEDICON 2004, X Mediterranean Conference on Medical and Biological Engineering and Computing. ISBN 88-7780-308-8.
82. **Cerveri P.** , Pedotti A., Ferrigno G. , A new technique for computing functional axes and the centres of rotation: the cases of lumbar spine and hand. IFMBE MEDICON 2004, X Mediterranean Conference on Medical and Biological Engineering and Computing. p. 1-4. ISBN 88-7780-308-8.
83. Masseroli M, **Cerveri P**, Pelicci PG, Alcalay M. GAAS: Gene Array Analyzer Software. A multi-user platform for management, analysis and visualization of gene expression data from replicate experiments. In: Abstract - Microarray Meeting 2003: III Convegno italiano sulla tecnologia. Array Technology Group - LITA. Milano, Italia; 28, 2003.
84. Masseroli M, Cerveri P, Alcalay M. GAAS: Gene Array Analyzer Software. In: Iacus SM, Gentleman R, Antoniadis A. A short course on Computational and Statistical Aspects of Microarray Analysis. Milan, May 26th-30th 2003.
85. **Cerveri P**, Ferrigno G., Pedotti A., Model-based approach and dynamic non-linear estimation for accurate human motion estimation, 2nd European Medical and Biological Engineering Conference EMBEC '02 ISSN 1680-0737, ISBN 3-901351-62-0, Vienna (AT) December 4-8, 2002.
86. Masseroli M, **Cerveri P**, Pelicci PG, Alcalay M. "A database-based application for management and statistical analysis of high-throughput gene expression data". In: Kohane S. "Bio-Medical Informatics: One Discipline. Proceedings AMIA 2002 Annual Symposium". ISBN 1-56053-600-4. Hanley & Belfus, Inc. Philadelphia, PE; 2002; 1099.
87. Masseroli M., **Cerveri P.**, Pinciroli F. "Software agents and Java technology for cardiology data retrieval and visualization". In: Overhage JM, editor. /AMIA 2000: Converging information, technology and health care. //Proceedings American Medical Informatics Association 2000 annual symposium/; 2000 Nov 4-8; Los Angeles, CA. ISBN 1-56053-480-X. Philadelphia, PE: Hanley & Belfus, Inc.; 2000. p. 1084.
88. Masseroli M., **Cerveri P.**, Pinciroli F. "Java technology and bioimages: towards remote high quality medical imaging". In: Overhage JM, editor. /AMIA 2000: Converging information, technology and health care.

//Proceedings American Medical Informatics Association 2000 annual symposium/; 2000 Nov 4-8; Los Angeles, CA. ISBN 1-56053-480-X. Philadelphia, PE: Hanley & Belfus, Inc.; 2000. p. 1083.

89. **Cerveri P**, Masseroli M, Pinciroli F. “Remote access to anatomical information: an integration between semantic knowledge and visual data”. In: Overhage JM, editor. /AMIA 2000: Converging information, technology and health care. //Proceedings American Medical Informatics Association 2000 annual symposium/; 2000 Nov 4-8; Los Angeles, CA. ISBN 1-56053-480-X. Philadelphia, PE: Hanley & Belfus, Inc.; 2000. p. 126-130.
90. **Cerveri P.**, Masseroli M., Pinciroli F., Portoni L., Vizzotto L. “Anatomical knowledge representation: attempting querying integration on VHD via UMLS”. /Proceedings/ /The Third Visible Human Project Conference/; 2000 Oct 5-6; Bethesda, MD. [CD-ROM] ISSN 1524-9008. Bethesda, MD: National Library of Medicine. 2000. p. 1-2.
91. **Cerveri P**, Masseroli M, Pinciroli F. “Java interface to human anatomy knowledge”. In: Vajda F, editor. /EUROMICRO 2000./ /Proceedings of the 26^th Euromicro Conference 2000/; 2000 Sep 5-7; Maastricht, NL. ISBN 0-7695-0780-8. Los Alamitos, CA: IEEE Computer Society Press; 2000. Vol. II, p. 384-390.
92. **Cerveri P.**, Masseroli M., Pinciroli F., ''Remote Access To Anatomical Information: An Integration Between Semantic Knowledge And Visual Data In: Overhage Jm. Converging Information, Technology And Health Care.'', Hanley & Belfus, Inc. Philadelphia, Pe, Proceedings Amia 2000 Annual Symposium ISBN: 1-56053-480-X, p. 126-30.
93. **Cerveri P.**, Masseroli M., Pinciroli F., ''Software Agents And Java Technology For Cardiology Data Retrieval And Visualization In: Overhage Jm. Converging Information, Technology And Health Care.'', Hanley & Belfus, Inc. Philadelphia, Pe, Proceedings Amia 2000 Annual Symposium ISBN: 1-56053-480-X, p. 1084.
94. **Cerveri P.**, Masseroli M., "Verso lezioni interattive di Anatomia Umana via Internet" NIR-IT2000, Formazione, Multimedialità, 3D e Nuove Tecnologie online alle soglie del nuovo millennio, Milano, 10-11-12 Aprile 2000.
95. Cerveri, G. Ferrigno and N.A. Borghese, "Evolution strategies and epipolar geometry for dynamic calibration of a photogrammetric camera system", European Medical and Biological Engineering Conference EMBEC '99, Vienna (AT) November 4-7, 1999.
96. **Cerveri P.**, Pinciroli F., Guglielmi L., ''Visible Human Dataset-Milano Mirror Site After Two Years Of Servicing The Continental Europe'', Elsevier Science B.V., Excerpta Medica, International Congress Series 1165, The Proceedings Of The 13th International Congress And Exhibition Computer Assisted Radiology And Surgery, Paris, France, pp. 307-311.
97. **Cerveri P.**, Pinciroli F., Guglielmi L., ''The Vhd-Mms Agente Retriever: An Image Retrieval System Based On Object Oriented Architecture'', Hypertext Paper In The National Library Of Medicine Proceedings On Cd-Rom Of The 2nd Visible Human Project International Conference, Bethesda MD, October 1-2, 1998, Ackerman M.J., Banvard R., **Cerveri P.**, Pinciroli F. Editors.
98. **Cerveri P.**, Pinciroli F., Guglielmi L., ''Multiresolution Image Representation Through Compression For Speeding-Up Navigation In The Visible Human Dataset Archive'', Hypertext Paper In The National Library Of Medicine Proceedings On Cd-Rom Of The 2nd Visible Human Project International Conference, Bethesda MD, October 1-2, 1998, Ackerman M.J., Banvard R., **Cerveri P.**, Pinciroli F. Editors.
99. Andreoni G., **Cerveri P.**, Ferrigno G., Rigotti C., ''Virtual Workspace And Man-Machine Interaction Design Via Human Movements Acquisition.'', Proc. Of Xth Icmmb '98, pp. 40-43, 1998.
100. **Cerveri P.**, Ferrari S., Borghese N.A, "Calibration of TV cameras through RBF networks" **Cerveri P.**, Ferrari S., Borghese N.A, "Calibration of TV cameras through RBF networks" SPIE Proceedings Vol 3165: Applications of Soft Computing, Bruno Bosacchi; James C. Bezdek; David B. Fogel, Editors, pp.312-318, 1997.

Multimedia CD-ROM

101. F. Pinciroli, L. Guglielmi, **P. Cerveri** " Bioimages for Europe '98", edited by L. Guglielmi, from Visible Human Dataset-Milano Mirror Site, 1998.
102. M. J. Ackerman, R. A. Banvard, **P. Cerveri**, F. Pinciroli, "The Visible Human Project Conference Proceedings, October 1 &2, 1998", edited by Richard A. Banvard and Pietro Cerveri, National Library of Medicine 1998.
103. F. Pinciroli, L. Guglielmi, **P. Cerveri** "Bioimages for Europe '99", edited by P. Cerveri, from Visible Human Dataset-Milano Mirror Site, 1999. ISBN 88-9000185-3-4

Chapters in Italian and international books

104. **Cerveri, P.**, Andreoni, A., Ferrigno, G. (2003) Accurate modeling and NN to reproduce Human Like Motion Trajectories. In Soft Computing Applications, ed. By A. Bonarini, F. Fasulli, G. Pasi, Advances in Soft Computing Series, Physica-Verlag, Heidelberg, New York, 47-58.
105. **Cerveri P.**, Corazza S., Ferrigno G., Frezza R. Misura del movimento e della postura: sistemi a marcatori passivi e metodi stereofotogrammetrici, Bioingegneria della Postura e del Movimento. A cura di Aurelio Capozzo, Angelo Cappello. Patron Editore, Bologna – 2003.
106. **Cerveri P.**, Ferrigno G., Recent developments in biomechanical data collection and processing: Probabilistic frameworks, state-space approaches and model-based techniques. Recent Research and Developments in Biomechanics. Vol. 1 pp. 269-302. 2003. ISBN: 81-7895-084-7.
107. De Momi E., **Cerveri P.**, Ferrigno G., Navigation in Computer-Assisted Orthopaedic Surgery, in User Centered Design for Medical Visualization. Edited By: Feng Dong, Gheorghita Ghine, Sherry Y. Chen, pp. 197-214, ISBN: 978-1-59904-777-5, 2008. ISBN: 978-1-59904-777-5.

Relevant abstracts

108. DeLorenzo D., Effetti O., De Momi E., **Cerveri P.**, Ferrigno G., (2006). Feasibility study of a wireless instrumented device to measure differential ligament stress in total knee arthroplasty. Journal of Biomechanics - VOL 39; SUPP/1; page S208 ISSN 0021-9290.
109. De Momi E., **Cerveri P.**, Ferrigno G. (2006) 3D shape iterative reconstruction method based on statistical models for TKA applications. Journal of Biomechanics VOL 39; SUPP/1; page(s)S570 ISSN 0021-9290.

National journals

N. Confalonieri, A. Manzotti, C. Chemello, P. Cerveri, La revisione computer assistita nei fallimenti asettici delle protesi monocompartimentali di ginocchio, Giot 38:55-61, 2012

Patents:

Title: "**Dispositivo per la rilevazione di superfici anatomiche all'interno di articolazioni**"

Pub. No.: MI2007A001469

Assignee : IST ORTOPEDICO GALEAZZI SPA Via Riccardo Galeazzi 4, I-20161 Milan (IT).

Inventor(s): G. Ferrigno, P. Cerveri, E. De Momi, W. Pascale

Date: 20-07-07

Title: **(WO/2008/129414) DEVICE FOR THE DETECTION OF ARTICULAR FORCES**

Pub. No.: WO/2008/129414 International Application No.:PCT/IB2008/001011
Assignee: IST ORTOPEDICO GALEAZZI SPA Via Riccardo Galeazzi 4, I-20161 Milan (IT)
Inventor(s): FERRIGNO G; CERVERI P; DE MOMI E, PASCALE W.
Date: 30.10.2008

Title: "**Architettura di robot articolato per uso medico**"

Pub. No.: n.BI.11.013.A

Assignee: Politecnico di Milano

Inventor(s): P. Cerveri, R. Zaltieri

Date: 24-10-2011

Title: "**Apparato miniaturizzato per visione endoscopica**"

Pub. No.: n. BI.12.010.A

Assignee: Politecnico di Milano

Inventor(s): P. Cerveri, C. Zazzarini

Date: 25-05-2012