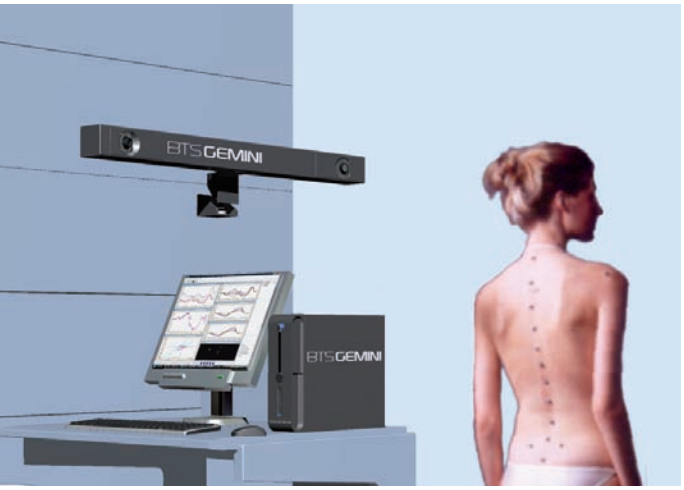
BTS GEMINI: a tool for the functional evaluation of postural disorders



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TRAMA Project - Final Meeting
Bogotà, Colombia

The availability of quantitative and 3-D data related to postural kinematics is fundamental for medical practitioners and rehabilitation professionals. Traditional evaluation methods can only provide qualitative and 2-D data. Such data referred to 3-D graphical representation, especially if the acquisition analyzes a dynamic task (i.e. bending), does not properly describe the performed movement. BTS GEMINI surpasses these technological limitations, providing a fundamental tool for any professional centre dealing with the assessment and treatment of postural disorders.

Testifying to this new technology, we asked one of our customers, **Dr. Bissolotti, medical practitioner in Physical Medicine and Rehabilitation for the Functional Recovery and Rehabilitation Service, Domus Salutis - Brescia, Italy**, to write about his experience using our system:

""The experience acquired on field at the FRR Service, Domus Salutis, confirms that BTS GEMINI can easily be integrated in diagnostic paths of any rehabilitation facility.
Due to its low encumbrance and portability it can be used in small outpatient departments as in rehabilitation gyms.

The integration of instrumental and clinical parameters allows to objectify both prescriptions and therapy results, improving the effectiveness and efficiency of diagnostics and therapeutic solutions in rehabilitation.
The use of BTS GEMINI within diagnostic and treatment services enabled us performing kinematic analysis of the trunk, morphological analysis of the spine, stabilometric tests for static and dynamical equilibrium analysis.

In light of what mentioned above, around 70% of patients afferent our rehabilitation facility are evaluated with BTS GEMINI.

Performable Kinematic evaluations can be executed for many pathological conditions, such as spinal pain and deformities, stroke consequences, balance and movement disorders with vestibular and cerebellar origins.

The instrumental Diagnostics services we perform are referred to the listing of charges".

BTS Bioengineering

TRAMA Project: final meeting

The TRAMA Project final meeting was held in Bogotá, Colombia.
This 3-year-long project, part of the aLFA Program of cooperation between Europe and South America related to university education, was aimed at training researchers for the quantitative movement analysis field, creating, moreover, a collaborative network for the institutions involved.

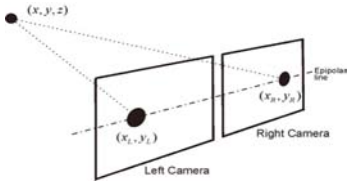
Main activities accomplished during the project were:

- Training in the use of in the movement analysis laboratory instruments, definition of new experimental set-ups and development of new technologies.
- Web based activities, including training and practical sessions aimed at explaining the meaning of clinical data acquired in the lab.
- Creation of a network among various centres for a continuous training and assistance.

For more info:
www.biomed.polimi.it/trama

The stereoscopic vision in motion analysis is a technique based on calculating 3-D coordinates of a reflecting marker, measured using the data extrapolated from images referring to two or more cameras which records the marker from different angles. When two cameras observe the same object, the visualization is defined as binocular.

The basic principle of stereoscopic vision is the so-called triangulation, and consists in the projection of the actual point from the observed scene on the image planes that belong to the cameras forming the stereoscopic vision system.
Below the graphical representation of the problem; it is necessary to identify at least two projections of the same material point.



The solution to such a problem requires the knowledge of appropriate parameters related to the stereoscopic system, generated during the calibration procedure: the intrinsic parameters include focal length and some information over the sensor-lense system (i.e. lens distortion, pixel shape, etc.) while the extrinsic ones represent positioning and orientation of the cameras within the space, related to a given reference system.