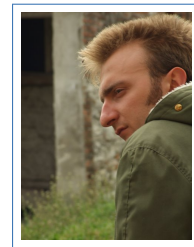


Diego Dall'Alba

Curriculum Vitae

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*For every complex problem there is always a simple solution.
That is wrong. G. B. Shaw*

PERSONAL INFORMATION

Date of Birth March 18, 1983
Place of Birth Schio, Vicenza, Italy
Nationality Italian
Marital Status Single

EDUCATION

September 2014 **Philosophy Doctor in Computer Science**, University of Verona, Verona, Italy.

Thesis: *"Navigation for percutaneous surgical interventions: ultrasound data processing, feature extraction and 3D organ reconstruction"*.

Description:

During my PhD I have designed and developed a feature detector and descriptor to localize and match salient points in ultrasound image. The detector is based on a local energy model, where feature points are localized by analyzing the phase congruency of frequency components. The descriptor is based on Local Binary Pattern operator computed over a local angle and direction of the phase congruency. I have also developed and tested a compact navigation device for percutaneous interventions that integrate a small display directly onto the ablation tool to provide navigation indications. The last contribution of my thesis is a method that overcomes the unfeasible monitoring of the ablation area with ultrasound image during cryoablation procedures, and it is based on ultrasound elastography.

December 2010 **Master of Science in Intelligent and Multimedia Systems**, University of Verona, Verona, Italy.

Graded: 110/110 *cum laude*

Thesis: *"Acquisition and three-dimensional reconstruction of ultrasound data"*.

Description:

Work developed in the Altair Robotics Laboratory at University of Verona (Italy). I have developed a new compact and lightweight 3D ultrasound system that is designed for surgery and emergency medicine. The system combines an optical tracking system with a compact USB ultrasound scanner to obtain a flexible and simple device.

December 2007 **Bachelor of Science in Information Technology: Multimedia**, *University of Verona, Verona, Italy*.
Graded: 110/110

Thesis: *"Engineering of a library for the management of psychophysical methods, optimized for experimental haptic"*.

Description:

Work developed in the Altair Robotics Laboratory at University of Verona (Italy). The thesis proposes a software architecture suitable for controlling the execution of multi-factorial psychophysical experiments. The library implements the principal methods available in the literature and makes the design of complex experiments very simple and straightforward.

July 2002 **Diploma in Industrial Engineering (Electronics and Telecommunications)**, *ITIS "Giacomo Chilesotti"*, Thiene, Vicenza, Italy.
Graded: 100/100

EXPERIENCE

June 2012 - **Research Assistant**, *University of Verona, Verona, Italy*.
now *"Patient safety in robotic surgery"*

Development of a real-time segmentation method for ultrasound images, focusing on tri-dimensional reconstruction and multi-modal registration. The work is inserted into SAFROS European project (<http://www.safros.eu>) and is developed in the Altair Laboratory.

Nov. 2011 - **Visiting Researcher**, *University of British Columbia, Vancouver, Canada*.
May 2012 *"Monitoring cryoablation lesions with quantitative ultrasound elastography"*

The work aims to monitor whether tissue has been properly frozen during Cryoablation by using Ultrasound Elastography to measure tissue elasticity after thawing, when the ablated tissue can be imaged again by US. An ex-vivo animal study confirms the feasibility of this approach.

Jan. 2011 - **Research Assistant**, *University of Verona, Verona, Italy*.
Oct. 2011 *"Patient safety in robotic surgery"*

Development of an image guidance system for abdominal surgeries based on tracked ultrasound data. The work was inserted into SAFROS European project (<http://www.safros.eu>) and was developed in the Altair Laboratory.

June 2010 - **Research scholarship**, *University of Verona, Verona, Italy*.
Dec. 2010 *"Processing of ultrasound data"*

Analysis of the available methods suitable for the reconstruction of three-dimensional models of anatomical structures of interest from ultrasound data. The work was inserted into SAFROS European project (<http://www.safros.eu>) and was developed in the Altair Laboratory.

April 2010 - **Stage**, *Department of Biotechnology, University of Verona, Verona, Italy*.
May 2010 Development of ByoGear software. In this project I have developed a simple software that enables graphic comparison of the position of the same genes on different genome.

Oct. 2008 - **Research scholarship**, *University of Verona, Verona, Italy*.
Dec. 2009 *"Development of a software for the automatic segmentation of biomedical imaging (CT)"*

Development of a software for medical image segmentation and 3D models generation. In this work I have learned the principal algorithms for image processing applied to CT medical images. The work was part of the AccuRobAs European project (<http://www.accurobas.org>) and was developed in the Altair Laboratory.

Mar. 2008 - **Research scholarship**, University of Verona, Verona, Italy.

Sep. 2008 "*Development of a library of methods for conducting experiments on the perception of forces with haptic devices*"

Implementation using the C++ language of the software architecture designed during the BSc thesis. The library was used to perform psychophysical experiments in the Altair laboratory, with focus on haptic perception.

Sep. 2002 - **Referent for testing**, DEA Electron s.r.l., Piovene Rocchette, Vicenza, Italy.

Aug. 2004 Testing of electronic devices. Functional testing on custom bench, In Circuit Testing with flying probe and bed of nails.

TECHNICAL SKILLS

Programming languages.

Python, Matlab/Octave, C, C++, L^AT_EX, XML.

Libraries and framework.

VTK, ITK, OpenGL, POSIX calls, pthreads.

Operating Systems.

Windows XP/Vista/7/8, Linux (Ubuntu, Debian).

Development tools.

gcc/g++, Microsoft Visual Studio, Geany, CMake, Mercurial, cvs, Doxygen.

Other tools.

Gimp, Microsoft Office and OpenOffice.org.

Notes:

C++ Good knowledge of the C/C++ languages and software development on Linux and Windows platform

Matlab Good knowledge of the Matlab/Octave environment

Python Excellent knowledge of scientific Python and of the visualization library for 2D (Mat-PlotLib) and 3D (Mayavi2) dataset.

LANGUAGES

Italian **Fluent**

mother tongue

English **Good**

Very good in reading and writing.

CONFERENCES AND PUBLICATIONS

CARS 2013 **Real-time Markerless Trocar tracking based on RGB-D sensor** D. Dall'Alba, C. Reghelin, P. Fiorini, Univ. of Verona (I)

CARS 2013 **A phantom study for the validation of a surgical navigation system based on real-time segmentation and registration methods** B. Maris, D. Dall'Alba, P. Fiorini, Univ. of Verona (I), A. Ristolainen, L. Li, Y. Gavshin, Univ. of Tallin (EST), A. Barsi, V. K. Adhikarla, Holografika (H).

- ICRA 2013 **Real-Time Biopsy Needle Tip Estimation in 2D Ultrasound Images** K. Mathiassen, O. J. Elle, Univ. of Oslo (N) D. Dall'Alba, R. Muradore, P. Fiorini, Univ. of Verona (I).
- IUS 2012 **Monitoring Cryoablation Lesions with Quantitative Ultrasound Elastography** D. Dall'Alba, Univ. of Verona (I), C. Schneider, C. Nguan, A. Baghani, R. Rohling, S. Salcudean, Univ. of British Columbia (CA).
- ITEC 2012 **Monitoring Cryoablation Lesions with Quantitative Ultrasound Elastography: a feasibility study** D. Dall'Alba, Univ. of Verona (I), C. Schneider, C. Nguan, A. Baghani, R. Rohling, S. Salcudean, Univ. of British Columbia (CA).
- IROS 2012 **A compact navigation system for free hand needle placement in percutaneous procedures** D. Dall'Alba, B. Maris, P. Fiorini, Univ. of Verona (I).
- CARS 2012 **Marker based accuracy analysis of RGB-D sensor for image guided applications** D. Dall'Alba, B. Maris, C. Reghelin, P. Fiorini, Univ. of Verona (I)
- CARS 2012 **Multimodal Data Fusion and Registration for Needle Guidance in Percutaneous Procedures** B. Maris, D. Dall'Alba, P. Fiorini, Univ. of Verona (I).
- CARS 2011 **Cheap and Portable 3D Ultrasound Acquisition** D. Dall'Alba, D. Zerbato, P. Fiorini, Univ. of Verona (I).
- Fechner Day
2010 **Measuring pliable perception capabilities in teleoperated and virtual environments.** M. Vicentini, M. Righele, D. Zerbato, D. Dall'Alba, D. Botturi, Univ. of Verona (I).
- CARS 2010 **Image based accuracy analysis in dental implantology applications.** D. Dall'Alba, L. Giona, D. Zerbato, D. Botturi, P. Fiorini, Univ. of Verona, G. Schirolli, Dental Team Srl, Genova (I).
- CARS 2010 **Enhancing maxillofacial implantology with virtual fixtures.** D. Zerbato, D. Dall'Alba, L. Giona, M. Vicentini, D. Botturi, P. Fiorini, Univ. of Verona (I).
- CAI
Academy
Conf. 2009 **In vitro evaluation of robotic assisted planning for dental implantology.**
- CARS 2009 **Patient Centered Simulation: Segmentation.** during the workshop on **Data Flow and Integration of Computer and Robot Assisted Surgical Procedures**
- Fechner Day
2009 **Stopping rule determination for Green's Maximum-Likelihood Adaptive procedure with PsychoGear Library** M. Vicentini, D. Dall'Alba, D. Botturi, Univ. of Verona (I).
- Fechner Day
2009 **PsychoGear, Yet another Psychophysics Library** D. Dall'Alba, M. Vicentini, D. Botturi, Univ. of Verona (I).

PATENTS

- Europe 2012 **SYSTEM AND METHOD FOR GUIDING THE MANUAL INSERTION OF A NEEDLE INTO THE BODY OF A PATIENT DURING A PERCUTANEOUS SURGICAL PROCEDURE**
D. Dall'Alba, B. Maris, P. Fiorini, Univ. of Verona (I).
- USA &
Canada 2012 **ELASTOGRAPHY-BASED ASSESSMENT OF CRYOABLATION**

D. Dall'Alba, Univ. of Verona (I), C. Schneider, C. Nguan, A. Baghani, R. Rohling, S. Salcudean, Univ. of British Columbia (CA).

INTERESTS

Sport:

Trekking I love hiking in the mountains.

Snowboarding I practice this activity since 2003.

Other:

Volunteering I participate in initiatives related to the spread of open-source tools, even in contexts of exclusion and discrimination (basic computer literacy courses for immigrant women).