Alessandro **Delmonte**

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Biomedical engineer specialized in artificial intelligence, machine learning and computer vision with applications to image processing and 3D modeling. Currently engineer of the image-guided surgery research team at Necker hospital.

Experience

Necker Hospital for Sick Children - Imagine Institute

March 2019 - Current

Research Engineer (AI Scientist & Computer Vision Engineer) — *Paris, FR*

- Definition, development and deployment of deep-learning methods for multi-class 3D semantic MRI segmentation. TensorFlow and PyTorch based. Workflow integration and clinical validation in robotic-assisted pediatric cancer surgeries. Selected for funding and scientific acceleration projects. Scientific dissemination planned.
- Project management and development of a 3D models interaction and visualization platform in Unity. Prototype actively used in OR and leading to IP deposits.
- Classification and regression analysis of medical and biological data for recovery predictions and decision support.
- Database and pipelines management. Continuous Integration. Technical/scientific documentation redaction.
- Technology transfer with market analysis, grants preparation and investors meetings. Assessed competition, pricing, IP, market access. Strategy definition for start-up creation in medical imaging and clinical data analysis (HEC collaboration).
- 3D printing of bio-mechanical parts for clinical and research purposes. FDM, SLS and PolyJet. External collaborator in several clinical projects (radiology, ENT, cardiology, ...).
- External consultant for VR applications for surgical simulations and skills-assessment, data visualization and interaction. Start-up (VirtualiSurg) and research (Pasteur Institute Decision and Bayesian Computation).
- PhD students technical co-supervision (Télécom Paris).

Research Engineer (Medical Image Processing Developer) — *March 2018 - Feb. 2019*

- Symbolic AI for MRI processing and segmentation. Integration of medical knowledge in mathematical and AI models.
- Nervous network reconstruction with unsupervised clustering methods, mathematical modeling and fuzzy sets theory. Development in Python (scikit-learn, scipy, OpenCV, AST) with focus on performance (parallel computing, ...) and usability.
- Projects leading to multiple scientific publications. Presentation in international conferences.
- Portability work-flow coordination. UI development for software plug-ins. UX and software ergonomics investigation.
- Internet site development and management for different teams.
- Master students co-supervision (Télécom Paris, Paris Descartes University).

LTCI, Télécom Paris - Institut Polytechnique de Paris

Sep. 2017 - Feb. 2018

Research Engineer Intern (Fuzzy Logic Researcher) — *Paris, FR*

- Uncertainty analysis with fuzzy logic for medical imaging processing. Spatial reasoning for human-centered interactions.
- Diffusion MRI processing for nervous network pathways classification.

Education

Polytechnic University of Turin

2018

M.Sc. in Biomedical Engineering - Major: Medical Informatics — *Turin, IT*

Languages

Italian: Mother-tongue **English:** Full Professional Proficiency **French:** Full Professional Proficiency

Skills

AI, ML, Data Science and Mathematics: Strong experience in supervised and unsupervised machine learning, DL and AI algorithms. Python data science stack. Good foundations of statistical approaches. Mathematics and geometry methods for image processing, data analysis and 3D computing. Familiar with SQL and DBMS.

Productivity: Agile methodology. Creative thinking and problem-solver. User-centered design.

Communication: Excellent communication skills in multi-discipline multi-cultural environments. Redaction of dissemination material, technical papers and documentation.

Programming	Python, C# (Unity), R, Matlab	**DL Frameworks**	TensorFlow, PyTorch	**Front-End**	HTML, CSS
Version Control	Git, SVN	**DevOps**	Docker, AWS	**OS**	GNU/Linux, MacOS, Windows
Project Management	Jira, Trello, Asana	**Productivity**	Bash, Vim, LaTeX, Office		

Familiar with Java and C++ (VTK, ITK)

Patents & Software Deposits

IMAG2Surg *Oct. 2019*

Delmonte A. (60%), Bloch I. (20%), Sarnacki S. (20%)

Medical 3D model interaction and exploration tool for surgical planning, intra-operative guidance and post-op recovery assessment.

Invited Speaker

Quantification for Diagnosis - BioImaging (BIM) *2019-20 - 2020-21*

École nationale supérieure d'arts et métiers, ENSAM

Courses

Leading Changes in Health Informatics John Hopkins University *2020-21*

Bio-entrepreneurs Launchpad Program HEC Paris & École Polytechnique de Paris @ Institut Imagine & BPI France *2019-20*

Computational Brain Connectivity Mapping (CoBCoM) Inria Sophia Antipolis *2017-18*

Papers & Abstracts

Introduction of 3D Modeling and Nerves Tractography In The Management Of Pelvic Tumors *Oct. 2020*

Goulin J., Meignan P., Blanc T., Delmonte A., Peyrot Q., Berteloot L., Boddaert N., Bloch I., Sarnacki S. - SIOP 2020 (International Society of Pediatric Oncology) *Toronto, CAN*

Reconstruction 3D en IRM du pelvis de l'enfant: segmentation des structures osseuses par IA *Oct. 2019*

Peyrot Q., Muller C.O., Virzi A., Delmonte A., Meignan P., Berteloot L., Grevent D., Blanc T., Gori P., Boddaert N., Bloch I., Sarnacki S. - SFCP - 76ème Congrès de Chirurgie Pédiatrique *Strasbourg, FR*

Etude du développement du système nerveux périphérique pelvien : du fœtus à l'enfant porteur de malformations et tumeurs pelviennes *Oct. 2019*

Meignan P., Muller C.O., Belle M., Peyrot Q., Delmonte A., Berteloot L., Grevent D., Blanc T., Boddaert N., Chedotal A., Bloch I., Sarnacki S. - SFCP - 76ème Congrès de Chirurgie Pédiatrique *Strasbourg, FR*

Integrating tractography in pelvic surgery: a proof of concept *Sep. 2019*

Muller C.O., Mille E., Virzi A., Marret J.B., Peyrot Q., Delmonte A., Berteloot L., Gori P., Blanc T., Grevent D., Boddaert N., Bloch I., Sarnacki S. - Journal of Pediatric Surgery Case Reports

Nervous System Exploration Using Tractography To Enhance Pelvic Surgery *June 2019*

Delmonte A., Muller C.O., Meignan P., Peyrot Q., Virzi A., Berteloot L., Grevent D., Blanc T., Gori P., Boddaert N., Bloch I., Sarnacki S. - Surgetica at CARS (Computer Assisted Radiology and Surgery) *Rennes, FR*

Biometric and Morphological Features of the Fetal Bladder in Lower Urinary Tract Obstruction on Magnetic Resonance Imaging. New Perspectives for Fetal Cystoscopy *April 2019*

Vinit N., Grevent D., Millischer-Bellaiche A., Pandya V., Sonigo P., Delmonte A., Sarnacki S., Aigrain Y., Boddaert N., Bessières B., Benchimol G., Salomon L., Stirnemann J., Blanc T., Ville Y. - Ultrasound in Obstetrics and Gynecology

White Matter Multi-Resolution Segmentation Using Fuzzy Set Theory *April 2019*

Delmonte A., Mercier C., Pallud J., Bloch I., Gori P. - IEEE ISBI (International Symposium on Biomedical Imaging) *Venice, IT*

Segmentation of White Matter Tractograms Using Fuzzy Spatial Relations *June 2018*

Delmonte A., Bloch I., Hasboun D., Mercier C., Pallud J., Gori P. - OHBM Annual Meeting (Organization for Human Brain Mapping) *Singapore, SG*

Links

https://www.linkedin.com/in/delmontealessandro

https://aledelmo.github.io

https://scholar.google.com/citations?user=jZ0PizMAAAAJ

https://www.imag2.org (IMAG2 Team)