

# Alessandro Delmonte

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Biomedical engineer specialized in artificial intelligence, machine learning and computer vision with applications to medical imaging. Industry, academia and public healthcare experience. Currently Senior AI Engineer in the imaging division of Clario R&D department.

## Experience

### Clario

June 2022 - Current

#### SENIOR ARTIFICIAL INTELLIGENCE ENGINEER

Lyon, FR

Clario is the global leader in technology services for clinical trials management. As a senior member of the algorithms and automation team, I provided innovative AI solutions for large-scale trials based on medical imaging technologies.

- Design and implementation of predictive AI models and image processing algorithms for real-world highly unbalanced data, contributing to the automation of multiple clinical trials accounting for thousands of patients across the globe.
- Development of artificial neural networks for image segmentation and classification. Identification of suitable AI systems and definition of requirements alongside imaging scientists and sponsors for musculoskeletal, oncology and neurology projects.
- Agile project management within a team based in California, Taiwan and France. Tech leadership to engineers and contractors.
- Direct contribution to features deployed in critical applications, adhering to pharmaceutical and med-tech industry regulations and establishing departmental standards. Deployment in industrial cloud-based environments.

### Necker Hospital for Sick Children - Imagine Institute

March 2018 - May 2022

#### RESEARCH ENGINEER (AI & COMPUTER VISION)

Paris, FR

Necker is the main European pediatric hospital for robotic surgery. Leading the image-guided surgery team, I delivered digital twin technologies and augmented reality systems used in more than 100 complex operations. I managed the AI research and the tech transfer operations.

- Supervised learning for organ localization and multi-class MRI/CT semantic segmentation. Interactive CNN for a class agnostic click-based correction system. Conceptualization and development of a image processing pipeline achieving fast and accurate patients 3D modeling.
- Deep learning for stereo-vision reconstruction, video segmentation and partial point cloud registration for a near real-time representation of the operative field. Integration of an overlay system for surgical guidance during robotic procedures.
- Nervous network reconstruction using symbolic AI. Expert system integrating medical knowledge using unsupervised clustering, mathematical modeling and fuzzy sets theory. Publication of multiple peer-reviewed papers.
- Development and deployment of a 3D interaction and visualization software using a graphic engine. App routinely used in the operative room.
- Raised more than 300k€ in funding. Project incubation at ParisBiotechSanté leading to a spin-off start-up creation. Assessed IP, market access, clinical and business strategy. Prepared academic grants, participated in VC meetings and implemented KOL relationships.
- Technical supervision of 1 engineer, 4 engineering interns and 3 medicine residents. Collaboration with 4 PhD students.

### Télécom Paris - Institut Polytechnique de Paris

Sep. 2017 - Feb. 2018

#### RESEARCH ENGINEER INTERN

Paris, FR

Research internship in the image, data and signal processing lab (LTCl - IDS) of the leading French engineering school in artificial intelligence.

- Uncertainty analysis with fuzzy logic and spatial reasoning for human-centered interactions.
- Diffusion MRI processing for nervous network classification. Peer-reviewed at international conferences.

## Education

Polytechnic University of Turin - M.Sc. IN BIOMEDICAL ENGINEERING

2018

Télécom Paris - Institut Polytechnique de Paris - EXCHANGE PROGRAM

2017

## Languages

**French:** Full Professional Proficiency

**English:** Full Professional Proficiency

**Italian:** Mother-tongue

## Skills

**Programming** Python, C#, C++, R, Matlab

**AI Frameworks** TensorFlow, PyTorch, scikit-learn, XGBoost

**MLOps** Docker, AWS, MLFlow, Git

**CV Tools** Unity3D, OpenCV, Qt, ITK

**Productivity** Bash, Vim, 𐀀𐀁𐀂, Office

**Management** Agile, Jira - Atlassian, Asana

**Front-End** HTML, CSS

**Other** Unix, 3D Printing

# Intellectual Property

## Automatic Generation of 3D Anatomical Models

Patent Pending

DELMONTE A., BLOCH I., SARNACKI S.

European Patent

Various example embodiments relate generally to a method / device for automatic segmentation of medical images and a method / device for representing the segmented image together with the peripheral nervous system.

## IMAG2Surgery

Oct. 2019

DELMONTE A. (60%), BLOCH I. (20%), SARNACKI S. (20%)

APP software deposit

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

# Invited Speaker

## École nationale supérieure d'arts et métiers (ENSAM) - Master BME BioImaging Program

2019-20 - 2020-21 - 2021-22

Title: Machine Learning for Medical Image Analysis - [Link](#)

## Université de Paris Medical School - DIU Robotic Surgery

2022

Title: Image Guided Robotic Surgery - [Link](#)

## Université de Paris Medical School - DFGSM3

2021-22

Title: Image Guided Surgery and Artificial Intelligence - [Link](#)

# 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

- Contribution of Diffusion Tensor Magnetic Resonance Imaging and Fiber Tractography to the Endophenotype of Anorectal Malformations.

2022

J. Goulin, [A. Delmonte](#), L. Berteloot, C. Lozach, S. Beaudoin, C. Capito, C. Chardot, T. Blanc, C. Cretolle, C.O. Muller, P. Meignan, Q. Peyrot, N. Boddaert, I. Bloch, S. Sarnacki - *Journal of Urology*

Submitted

- Automatic Size and Pose Homogenization with Spatial Transformer Network to Improve and Accelerate Pediatric Segmentation

Apr. 2021

La Barbera G., Gori P., Boussaid H., Belucci B., [Delmonte A.](#), Goulin J., Sarnacki S., Rouet L., Bloch I. - *IEEE ISBI (International Symposium on Biomedical Imaging)*

Nice, FR

- 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. - *Pediatric Blood And Cancer - SIOP 2020 Best Paper Award*

Toronto, CAN

- 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.](#), 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

- 5 abstracts and oral presentations at the French Congress of Pediatric Surgery [Francophone Event]

2019-22

[Delmonte A.](#), Lubet A., Kassir R., Goulin J., Meignan P., Peyrot Q. - *SFCP Congrès de Chirurgie Pédiatrique*