



# Thomas Demarcy, PhD

COMPUTER VISION · MEDICAL DEVICE · DATA SCIENCE

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## Experience

### KardioMe

CONSULTANT

- Fine tuning Deep Learning models for cell detection
- Funder: Jan Margeta (✉ jan@kardio.me)

Bratislava, Slovakia

Oct. 2020 - Present

### Oticon Medical

DATA SCIENTIST

- Image-Guided Cochlear Implant (CI) Programming [DDA+20]
- Towards Automatic CI Fitting
- Supervisor: Dan Gnansia (✉ dagn@oticonmedical.com), General Manager: Cédric Briand (✉ cbri@oticonmedical.com)

Vallauris, France

Fev. 2020 - Aug. 2020

PROJECT TECHNICAL LEAD

- Full development of a cloud-based image analysis platform for surgeons and audiologists. [DPG+19, MM, FR3, NM, UCA]
- Components: Kubernetes (Deployment), Celery (Task Queue), Django (REST API)
- Very reduced team: 2 developers

Jan. 2019 - Jan. 2020

RESEARCH SCIENTIST

- Medical Image Analysis & Scientific Visualization [DVG+19, DVG+18b]
- Electrode Array Design [MDH+19, DVG+18a]
- Magnetic Resonance Safety & Compatibility [MH18]
- Objective Measures [RHD+18]

Sep. 2017 - Dec. 2018

### Inria & Oticon Medical

PHD CANDIDATE

- *Segmentation and Anatomical Variability of the Cochlea from Medical Images* (📄 [www.theses.fr/204374316](http://www.theses.fr/204374316))
- Publications: [VDR+15, GDV+16, DVR+16, DVG+17, DWV+20]
- Grant: UCA<sup>JEDI</sup> "Investments in the Future" ANR-15-IDEX-01 used to fund Z. Wang's PhD (2018 - 2021).
- Research Project: Asclepios (now Epione)
- Advisors: Nicholas Ayache (✉ [nicholas.ayache@inria.fr](mailto:nicholas.ayache@inria.fr)) & Hervé Delingette (✉ [herve.delingette@inria.fr](mailto:herve.delingette@inria.fr))

Sophia Antipolis, France

Nov. 2013 - Jul. 2017

### Philips Research

INTERN

- *Automated Organ Detection in Water-Fat Separated Magnetic Resonance Imaging* [DSS14]
- Keywords: Object Detection, Random Forrest

Hamburg, Germany

Apr. 2013 - Sep. 2013

### National Centre for Scientific Research (CNRS)

INTERN

- *Study of Intracellular Microrheology by Using Magnetic Nanowires* [SKD+14]
- Keywords: Nanoparticles, Videotracking

Paris, France

May 2012 - Sep. 2012

## Side Projects

### Nice University Hospital

NEUROSURGERY & ULTRA-SOUND IMAGING DEPARTMENTS

- *Ultra High-frequency Ultrasound Imaging Vascular Segmentation* [AFD+19]

Nice, France

Sep. 2016 - Sep. 2017

### Saint-Étienne University Hospital

ANGIOLOGY & ANATOMICAL PATHOLOGY DEPARTMENTS

- *Atherosclerotic Plaque Characterization from Ultrasound Images* with C. Boissier, MD/PhD
- *Laryngeal Nerve Modeling from Microscopy Images* with M.-D. Dubois, MD/PhD

Saint-Étienne, France

Sep. 2011 - Sep. 2013

# Education

## Université Côte d'Azur

PHD IN AUTOMATIC CONTROL, SIGNAL & IMAGE PROCESSING

Sophia Antipolis, France

Nov. 2013 - Jul. 2017

## École Nationale Supérieure des Mines de Saint-Étienne

MASTER OF SCIENCE AND EXECUTIVE ENGINEERING (DIPLÔME D'INGÉNIEUR CIVIL DES MINES)

- Major: Biomedical Engineering
- Specialization: Medical Imaging

Saint-Étienne, France

Sep. 2010 - Sep. 2013

MS IN IMAGE AND PATTERN PROCESSING, ANALYSIS AND MODELING

- Score > 70%, Evaluated A+

Sep. 2012 - Sep. 2013

## Indian Institute of Technology

EXCHANGE SEMESTER

- Credits awarded in: Engineering Mathematics & Mechanics, Modern Engineering Materials, Polymeric Coating, ...

Delhi, India

Jul. 2011 - Dec. 2011

## Lycée Charlemagne

PREPARATORY CLASS TO THE GRANDES ÉCOLES AND COMPETITIVE EXAMS

- Majors: Mathematics, Physics & Chemistry

Paris, France

Sep. 2008 - Aug. 2010

A-LEVEL IN MATHEMATICS & SCIENCES (BACCALAURÉAT)

- Score > 80%

Jul. 2008

# Skills

<b>Programming</b>	Python, C++, bash, git, $\LaTeX$
<b>Libraries</b>	SciPy, scikit-learn, pandas, ITK, VTK, OpenCV, Keras
<b>DevOps</b>	Azure, Docker, Kubernetes
<b>Languages</b>	French <b>C2</b> , English <b>C2</b> , German <b>B2</b>

# Publications

## PEER-REVIEWED JOURNAL PAPERS (1<sup>ST</sup>, 2<sup>ND</sup> & 3<sup>RD</sup>)

[DDA+20]	F. Danieli, <b>T. Demarcy</b> , M. S. A. do Amaral, [...] and M. A. Hyppolito. <i>Auditory Performance of Post-Lingually Deafened Adult Cochlear Implant Recipients Using Electrode Deactivation Based on Postoperative Cone Beam CT Images</i> . European Archives of Oto-Rhino-Laryngology, 2020.
[DWV+20]	<b>T. Demarcy</b> , Z. Wang, C. Vandersteen, [...] and H. Delingette. <i>Joint Appearance and Shape Model Inference for the Segmentation of CT Images of the Cochlea</i> . 2020. (To be Submitted to IEEE Transactions on Medical Imaging)
[WVD+19]	Z. Wang, C. Vandersteen, <b>T. Demarcy</b> , [...] and H. Delingette. <i>Deep Learning Based Metal Artifacts Reduction in Post-operative Cochlear Implant CT Imaging</i> . MICCAI, 2019.
[MDH+19]	E. T. Massuda, <b>T. Demarcy</b> , M. Hoen, [...] and M. A. Hyppolito. <i>Electrode Migration in Patients with Straight Cochlear Implant Electrodes from Cone Beam Computed Tomography</i> . Cochlear Implants International, 20(5), p. 237-241, 2019.
[AFD+19]	F. Almairac, D. Fontaine, <b>T. Demarcy</b> , [...] and C. Raffaelli. <i>Motor Cortexneurovascular Coupling: Inputs from Ultra High-frequency Ultrasound Imaging in Humans</i> . Journal of Neurosurgery, 131(5), p. 1347-1682, 2019.
[RHD+18]	F. Russo, M. Hoen, <b>T. Demarcy</b> , [...] and I. Mosnier. <i>Pupillometry Assessment of Listening Effort in Adult Cochlear Implanted Patients</i> . Trends in Hearing, 2018. (In Revision)
[DVG+17]	<b>T. Demarcy</b> , C. Vandersteen, N. Guevara, [...] and H. Delingette. <i>Automated Analysis of Human Cochlea Shape Variability from Segmented <math>\mu</math>CT Images</i> . Computerized Medical Imaging and Graphics, 59, p. 1-12, 2017.
[VDR+15]	C. Vandersteen, <b>T. Demarcy</b> , C. Roger, [...] and N. Guevara. <i>Impact of the Surgical Experience on Cochleostomy Location: A Comparative Temporal Bone Study Between Endaural and Posterior Tympanotomy Approaches for Cochlear Implantation</i> . European Archives of Oto-Rhino-Laryngology, 273(9), p. 2355-2361, 2015.
[SKD+14]	N. Schonbeck, K. Kvale, <b>T. Demarcy</b> , [...] and J.-F. Berret. <i>Surfactant-Triggered Disassembly of Electrostatic Complexes Probed at Optical and Quartz Crystal Microbalance Length Scales</i> . Langmuir, 30(19), p. 5620-5627, 2014.

## PEER-REVIEWED ARCHIVED CONFERENCE & WORKSHOP PAPERS (1<sup>ST</sup> & 2<sup>ND</sup>)

- [DVR+16] **T. Demarcy**, C. Vandersteen, C. Raffaelli, [...] and H. Delingette. *Uncertainty Quantification of Cochlear Implant Insertion from CT Images*. Clinical Image-Based Procedures. Translational Research in Medical Imaging. CLIP 2016. Lecture Notes in Computer Science, 9958, p. 27-35, 2016.
- [GDV+16] D. Gnansia, **T. Demarcy**, C. Vandersteen, [...] and N. Ayache. *Optimal Electrode Diameter in Relation to Volume of the Cochlea*. European Annals of Otorhinolaryngology, Head and Neck Diseases, 133, p. S66-S67, 2016.
- [DSS14] **T. Demarcy**, A. Saalbach, and J. S  n  gas. *Automated Organ Detection in Water-Fat Separated Magnetic Resonance Imaging*. Proceedings of the International Society for Magnetic Resonance in Medicine, 8(4), p. 4499, 2014.

## ORAL PRESENTATIONS

- [DVG+19] **T. Demarcy**, C. Vandersteen, D. Gnansia, [...] and N. Guevara. *Pre- and Postoperative Automatic Cochlear 3D Reconstruction Dedicated to Personalized Cochlear Implantation*. 14<sup>th</sup> European Symposium on Pediatric Cochlear Implantation, 2019.
- [DVG+18a] **T. Demarcy**, C. Vandersteen, D. Gnansia, [...] and N. Guevara. *Insertion Depth and Curvature Assessment of Cochlear Implantation*. 10<sup>th</sup> International Symposium on Objective Measures in Auditory Implants, 2018.
- [DVG+18b] **T. Demarcy**, C. Vandersteen, D. Gnansia, [...] and N. Guevara. *Cochlear Shape Variability from 987 Computed Tomography Images*. Association for Research in Otolaryngology, 41, 2018.
- [MH18] **T. Demarcy**, and M. Hoen. *Magnetic Resonance Imaging and Cochlear Implant*. Latin American Meeting for Prevention and Treatment of Hearing Loss, 2018.
- [DVG+16] **T. Demarcy**, C. Vandersteen, D. Gnansia, [...] and N. Guevara. *Estimation of Postoperative Cochlear Implant Electrode-Array Position From Clinical Computed Tomography*. Annales Fran  aise d'Oto-Rhino-Laryngologie et de Pathologie Cervico-faciale, 2016.

## MEDIA COVERAGE

- [DPG+19] **T. Demarcy**, I. P  liss  n, D. Gnansia, [...] and N. Guevara. *Un mod  le de reconstruction tridimensionnelle de la cochl  e au service de l'implantation cochl  aire*. Les Cahiers de l'Audition, 4, p. 36-40, 2019.
- [MM] M  tropole Mag N   29, p. 20-22, September, 2019. ([sophia-mag.com/wp-content/uploads/2019/09/MM29\\_24x33\\_BD.pdf](https://sophia-mag.com/wp-content/uploads/2019/09/MM29_24x33_BD.pdf))
- [FR3] 19/20, France 3 Provence Alpes C  te d'Azur, June 27, 2019. ([france3-regions.francetvinfo.fr/provence-alpes-cote-d-azur/alpes-maritimes/nice/c-est-rennaissance-laura-retrouve-audition-apres-20-ans-surdite-grace-implant-cochleaire-1691432.html](https://france3-regions.francetvinfo.fr/provence-alpes-cote-d-azur/alpes-maritimes/nice/c-est-rennaissance-laura-retrouve-audition-apres-20-ans-surdite-grace-implant-cochleaire-1691432.html))
- [NM] Nice Matin, June 16, 2019. ([www.nicematin.com/sante/premiere-mondiale-a-nice-deux-patients-atteints-de-surdite-severe-ont-retrouve-laudition-grace-a-un-implant-390152](https://www.nicematin.com/sante/premiere-mondiale-a-nice-deux-patients-atteints-de-surdite-severe-ont-retrouve-laudition-grace-a-un-implant-390152))
- [UCA] UCA News, June 14, 2019. ([web.univ-cotedazur.fr/contenus-riches/actualites/fr/une-collaboration-entre-le-chu-linria-et-oticon-donne-de-lespoir](https://web.univ-cotedazur.fr/contenus-riches/actualites/fr/une-collaboration-entre-le-chu-linria-et-oticon-donne-de-lespoir))