François Gardavaud

Medical Physicist Expert (MPE) in medical imaging

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I have been practicing in medical imaging since 2011. I'm specialized in CT modality. I have a deep interest in programming and data science. This resume was even generated with the R language.

Professional Experience

Medical physicist in medical imaging

Paris

Tenon University Hospital - APHP. *Since 2014*

- Patient radiation protection, protocol optimization for CT and interventional room modalities, patient skin doses evaluation in interventional radiology, women foetus doses assessment, deployment and use of 2 dose monitoring systems.
- Exploratory data analysis with R language, signal processing with Matlab language, publication assistance for radiologists.
- IT support: management of post-processing consoles, implementation of DICOM nodes, automation scripts design for Mac stations, R scripts development for extraction and analysis of the department clinical activity ...
- Regulatory quality assurance. QC implementation in MRI.
- Technical support in imaging for my fellow physicists in radiation therapy.

Medical physicist in medical imaging

Paris

Mondor University Hospital - APHP. *2011 - 2014*

- Patient radiation protection, protocol optimization for X-Ray modalities, patient skin doses evaluation in interventional radiology, women foetus doses assessment, deployment and use of 1 dose monitoring systems.
- Regulatory quality assurance implementation.

Selected Publications

For a complete list of my publications see my Google Scholar profile.

- M. Barral, L. Lassalle, **F. Gardavaud** et al.. *Virtual Injection Software Reduces Radiation Exposure and Procedural Time of Prostatic Artery Embolization Performed with Cone-Beam CT* **J Vasc Interv Radiol**. 2023.
- J. Greffier, Y. Barbotteau and **F. Gardavaud**. *iQMetrix-CT: New software for task-based image quality assessment of phantom CT images.* **Diagnostic and Interventional Imaging**. 2022.
- F.H Cornelis, L. Razakamanantsoa, M. Ben Ammar, M. Najdaw, S. El-Mouhadi, **F. Gardavaud**, M. Barral. *Percutaneous screw fixation of pelvic bone metastases using cone-beam computed tomography navigation.* **Diagnostic and Interventional Imaging**. 2022.
- F.H Cornelis, L. Razakamanantsoa, M. Ben Ammar, M. Najdaw, **F. Gardavaud**, S. El-Mouhadi, M. Barral. *Percutaneous Image-Guided Vertebral Fixation in Cancer-Related Vertebral Compression Fractures: A Case Series Study.* **Medicina**. 2021.
- M. Barral, **F. Gardavaud**, L. Lassalle et al. *Limiting radiation exposure during prostatic arteries embolization: influence of patient characteristics, anatomical conditions and technical factors.* **European radiology**. 2021.
- M. Savanovic, **F. Gardavaud,** D. Jaros et al. *Contribution of Imaging to Organs at Risk Dose during Lung Stereotactic Body Radiation.* **J Biomed Phys Eng**. 2021.
- E. Kermarrec, **F. Gardavaud**, K. Kerrou et al. *Risk and safety of breast imaging during pregnancy and lactation.* **Imagerie de la Femme**. 2020.
- **F. Gardavaud**, S. Tavolaro, N. Grussenmeyer-Mary et al. *Peak Skin Dose evaluation for vascular clinical procedures in interventional radiology: a comparison between three computation numerical.* **Physica Medica** 2018.
- H. Pasquier, **F. Gardavaud**, M. Chiaradia et al. *Iterative reconstructions in multiphasic CT imaging of the liver: qualitative and task-based analyses of image.* **Clinical Radiology**. 2018.
- E. Herin, **F. Gardavaud**, M. Chiaradia et al. *Use of Model Based Iterative Reconstruction (MBIR) in reduced-dose CT scan for routine follow up for patients with lymphoma: dose savings, image quality and phantom study.* **European radiology**. 2015.
- E. Meyblum, **F. Gardavaud**, T-H. Dao et al. *Breast tomosynthesis: Dosimetry and image quality assessment on phantom.* **Diagnostic and interventional Imaging**. 2015.
- **F. Gardavaud**, A. Luciani, A. Rahmouni. *Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study.* Correspondence. **The Lancet**. 2012

Projects

IT Development

F. Gardavaud, H. Pasquier, A Luciani, A. Rahmouni. ProtoEnhance : software to help scan acquisition parameters optimization for the Legacy platform of GE HealthCare Computed Tomography

F. Gardavaud. Code to generate interventional radiology DRL and view key patient exposure statistics.

F. Gardavaud. Code to generate CT DRL and view key patient exposure statistics.

Patent

H. Pasquier, D. Crotty, S. Jacquot Ingles, A. Luciani, **F. Gardavaud**. Methods and apparatus to correct the measurement of water equivalent diameter in computed tomography when patients are miscentered. US patent US10966671B2. Avril 2021.

Mentoring Experience

Radiomic study to identify predictive biomarkers of radiochemotherapy treatment outcome in non-small cell lung cancer — *Tours University, February - August 2022*
Master 2 student internship supervisor.

Contribution of metabolic PET-CT imaging combined with radiomics analyzed surveillance imaging in locally advanced non-small cell lung cancer treated with radiochemotherapy to predict survival outcomes and toxicity — *Grenoble Alpes University, February - August 2022*
Master 2 student internship supervisor.

Medical physicics intership in medical imaging — *Tenon University Hospital 2014 - 2020*
Students internship supervisor.

Validation of an automated solution for organ dose estimation in CT — *Clermont-Ferrand University, April - October 2019*
Master 2 student internship supervisor.

Development of an automatic CT image analysis system — *Clermont-Ferrand University, February - August 2018*
Master 2 student internship supervisor.

Development of a system to assist in CT protocols personalized optimization — *Paris-Sud University, 2014 - 2017*
PhD student supervisor.

IGRT implementation on a Novalis TrueBeam Stx (Varian) — *Clermont-Ferrand University, March - August 2016*
Master 2 student internship supervisor.

Development of a module helping in CT acquisition parameters optimization — *Clermont-Ferrand University, March - August 2013*
Master 2 student internship supervisor.

Development of an evaluation module for CT-MRI fusion in brain imaging — *Clermont-Ferrand University, May - September 2012*
Master 1 student internship supervisor.

Study and implementation of reference doses levels delivered in interventional cardiology for diagnostic and therapeutic purposes — *Paris-Sud University, April - September 2012*
Master 2 student internship supervisor.

Quality controls implementation in CT scanning — *Créteil University, May - June 2011*
Bachelor student internship supervisor.

Teaching

Courses were given in French.

Image quality principle and CT application specificities — *Créteil University, Since 2014*
Teacher in master 2 SIM
- Course exposing the state of the art of the image quality qualification and quantification with medical physics tools.

Welcoming a new scanner: from acceptance to protocol optimization — *Buc, Since 2019*
Classroom GE HealthCare : Expert to Expert Physiciens.
- Program creation, practical work design
- Lecture : Fundamental properties of image quality.
- Lecture : State of the art on CT acceptance
- Lecture: Tips & tricks in CT.

AI in radiology

Faculty of Medicine Sorbonne University

TEACHER IN SECOND YEAR UNDERGRADUATE. *2019 - 2021*
- Lecture popularizing artificial intelligence concepts in medicine by illustrating with a medical physics project.

Advanced CT optimization with iterative reconstructions

Nîmes

POSTGRADUATE EDUCATION 🔗. *2021-10*
- Scientific council member : Program creation, practical work design, administrative tasks.
- Lecture: Classical and advanced metrics for CT image quality asssessment.
- Lecture : New metrics: can they be used on patients?

Patient radiation protection for medical physicists specialized in radiodiagnostics

Online

POSTGRADUATE EDUCATION *2021-01*
- Scientific council member : Program creation, practical work design, administrative tasks.
- Lecture : Image quality metrics.
- Lecture : image quality metrics tailored to CT iterative reconstruction .

CT performance

INSTN, Saclay

ENSEIGNANT À LA FORMATION DQPRM. *2018 - 2019*
- Course exposing the state of the art of the image quality qualification and quantification with medical physics tools.

Patient radiation protection for medical physicists specialized in nuclear medecine

Paris

POSTGRADUATE EDUCATION *2018-03*
- Lecture : Classical and advanced metrics for CT image quality asssessment. .

Patient radiation protection for medical physicists specialized in radiodiagnostics

Lyon

POSTGRADUATE EDUCATION *2017-09*
- Scientific council member : Program creation, practical work design, administrative tasks.
- Lecture : Image quality metrics.
- Lecture : image quality metrics tailored to CT iterative reconstruction

Education

Post-Graduate Training

All training courses have been passed in French, except those outside France

2023-10	Refresher training in biostatistics with JASP and JAMOVI software.	*URFIST Bordeaux, France*
2021-12	MOOC : Learn about Data Science and its challenges. 🏅 Certificate of achievement.	*France Université Numérique. CY Cergy Paris University*
2021-04	MOOC : Multidimensional data analysis. 🏅 Certificate of achievement.	*France Université Numérique. Agrocampus. Rennes*
2020-11	MOOC : Research Ethics. 🏅 Certificate of achievement.	*France Université Numérique. Lyon University.*
2019-10	MOOC : Introduction to Statistics with R. 🏅 Certificate of achievement.	*France Université Numérique. Paris Sud University.*
2019-06	Introduction to clinical data management and analysis with R. Intermediate level.	*Cancéropôle Ile-de-France. Paris*
2018-12	Postgraduate education : MRI: methodological bases and applications in imaging and radiotherapy.	*Clermont-Ferrand*
2018-12	MOOC : Introduction to clinical data management and analysis with R. Beginner level.	*Cancéropôle Ile-de-France. Paris*
2018-12	MOOC : Reproducible Research: Methodological Principles for Transparent Science. 🏅 Certificate of achievement.	*France Université Numérique. INRIA.*
2018-01	Computed Tomography – Technology, Dosimetry, Optimization. 🏅 Distinction Award.	*EFOMP School for MPE, Prague, Czech Republic*
2017-10	GE training in MRI sequence programming (EPIC and ORCHESTRA).	*GE Training Center, Buc*
2017-07	Magnetic Resonance Imaging: Advanced Clinical Applications Safety Aspects, Quality Control. 🏅 Distinction award.	*EFOMP School for MPE, Prague, Czech Republic*
2017-02	Leadership in Medical Physics: Development of the profession and the challenges for the Medical Physics Expert in Diagnostic and Interventional Radiology. 🏅 Merit award.	*EUTEMPE-RX, Module MPE01, Prague, Czech Republic*
2016-03	Role of the medical physicist in CT imaging and patient dose optimization. 🏅 Distinction award.	*EUTEMPE-RX, Module MPE08, Lausanne, Switzerland*
2015-10	Postgraduate education: Image Processing in Medical Physics.	*Nantes*

University education

Since 2019	PhD student : Development of a system to help CT sequences optimization during thoracic examination.	*ISCD - ED SMAER. Sorbonne University. Paris*
2009 -2010	French internship in medical physics.	*Institut Curie et Hôpital Militaire du Val-de-Grâce, Paris*
2009	French medical physics internship access context. Ranked 13th out of 78.	*Paris*
2008 - 2009	Master 2 - Research, mention Medical Physics. Honors.	*Paris XI university.*

Skills

Technical skills

Main Equipments	Professional software	QC material	Pahntoms
GE CT scanners	ADW	RTI Piranha	CATPHAN 600
GE and Hologic mammographs	ArtiScan	PTW pencil ionization chamber	Kyoto Kagaku PBU-60
GE interventional room	DoseWatch	Gafchromic XRCT2 films	Kyoto Kagaku Lungman
GE and Siemens MRI	ImageJ		Mercury Phantom
	Javista		
	MRQuantif		
	Osirix		
	RDM		

IT skills

Programming languages

AppleScript – Git – Markdown – Matlab – R – Shell

Software

FileZilla – Rstudio – Visual Code Studio

OS

macOS – Linux(Ubuntu) – Windows

Event organization

10/2021	Postgraduate education : Advanced optimization in computed tomography with iterative reconstructions.	*Nîmes*
01/2021	Postgraduate education : Patient radiation protection for medical physicists specialized in radiodiagnostics.	*En ligne*
09/2017	Postgraduate education : Patient radiation protection for medical physicists specialized in radiodiagnostics.	*Lyon*

Languages

Compétence	French	English	Spanish
Reading	mother tongue	C2	A1
Writting	mother tongue	C2	A1
Speaking	mother tongue	C1	A1

Common European Framework of Reference for Languages: A1/A2: Basic User. B1/B2: Independent User. C1/C2: Proficient User

Inter-professional activities

2017 - 2023	Vice-president of the medical physics college.	*APHP*
2017 - 2018	Secretary of the Imaging Section.	*French national society of medical physics*
2015 - 2016	Medical Physics Expert for Computed Tomography Tenders	*AGEPS - APHP*

Awards & Distinctions

2017	Medical Physicist Expert (MPE)	*EFOMP*
2016	Radiation Protection Pavilion Prize Winner	*CIRSE, Barcelona*
2009	Fellowship	*French national society of radiation protection*

References

- **Jean-Noel Foulquier, PhD**. CHU Tenon, APHP, Paris. `jean-noel.foulquier@aphp.fr`
- **Pr. François Cornelis, MD, PhD**. Memorial Sloan-Kettering Cancer Center, New York, USA. `cornelif@mskcc.org`
- **Pr. Alain Luciani, MD, PhD**. CHU Henri Mondor, APHP, Créteil. `alain.luciani@aphp.fr`

Interests and sport practice

- **Sport** : Bicycle, fitness session “Les Mills” and running.
- **Voyage** : Many trips to Europe area to discover other cultures; keen interest in Japanese culture.
- **Musique** : Guitar practice