



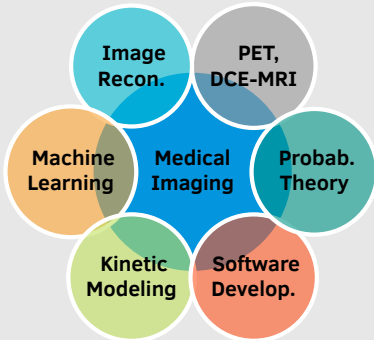
# Michele Scipioni

Biomedical Engineer, M.Sc.

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## Main Skills

### Overview



### Technical Skills

MATLAB • Python •  $\LaTeX$

Git(Hub) • HTML • SQL • Statistics

C • C++ • CUDA • PyTorch • R

**Others:** Word, Excel & PowerPoint; GIMP; Inkscape; Windows & Unix OS

### Language

Italian

English

Spanish

## About me

During the past 4 years, I have mainly worked in the field of medical images reconstruction while doing research for my MSc and PhD in Biomedical Engineering. These years of academia have allowed me to study and experiment with probabilistic modeling and to discover a real passion for programming and software development. I am now looking for an opportunity to prove myself in a stimulating and challenging context, where teamwork will allow me to keep improving my skill set. As medical imaging is my current field of expertise, I would welcome the possibility to work on healthcare-related problems.

## Experience

- Jan 2019 - today **Research Associate** CNR Institute of Clinical Physiology
  - Assisting ongoing research projects in Nuclear Medicine dept.: study design; data acquisition and image reconstruction; software development; data processing; manuscripts drafting.
  - Supervisor(s):** Dr. MF Santarelli
- Jan 2017 - Jul 2017 **Graduate Research Assistant** Martinus Center for Biomedical Imaging
  - Developing models and algorithm for kinetic-informed dPET and DCE-MRI reconstruction, and Gaussian-Mixture models for dPET segmentation, using Python (**Occiput**) and CUDA (**gpuKMfit**).
  - Design of acquisition protocols for T1 mapping and simultaneous PET/DCE-MRI scan on Siemens Biograph mMR
  - Supervisor(s):** Dr. S Pedemonte, Dr. JC Price, Dr. DN Greve
- Nov 2016 - Dec 2018 **Graduate Teaching Assistant** University of Pisa
  - TA for 248II (Biomedical Imaging) course for graduate students
  - Mentoring 3 students during their master thesis research
  - Awards:** University grant supporting TA position (2016 & 2017).
  - Supervisor(s):** Dr. MF Santarelli
- Apr 2015 - Nov 2015 **Intern @ Nuclear Medicine Department** Fondazione "G. Monasterio"
  - Design and validation of protocols for acquisition and processing of dynamic data in a clinical setting (GE Discovery RX).
  - Development of a software (**KMtoolbox**) for kinetic analysis of dynamic PET sequences, and command-line Linux scripts for anonymization and remote transfer of raw data
  - Supervisor(s):** Prof. L Landini

## Education

- Nov 2015 - Oct 2018 **Ph.D. with honors in Biomedical Engineering** University of Pisa, Italy
  - Thesis:** 4D tomographic image reconstruction and parametric maps estimation: a model-based strategy for algorithm design using Bayesian inference in Probabilistic Graphical Models (PGM)
  - Developed models for dPET and DCE-MRI image reconstruction assisted by kinetic modeling and clustering; design of strategies for improving maps' SNR and accelerating voxelwise fitting via GPU parallelization.
  - Awards:** 3yrs fully funded PhD scholarship; NVIDIA GPU Grant Program (1x), scholarship to attend intl. conference (2x).
  - Tasks:** Model design, inference algorithm derivation, software development, writing scientific publications and presentations.
  - Supervisor(s):** Prof. Luigi Landini, Dr. Maria Filomena Santarelli
- Oct 2012 - Apr 2015 **M.Sc. in Biomedical Engineering** University of Pisa
  - Supervisor(s):** Prof. Luigi Landini, Dr. Maria Filomena Santarelli
- Oct 2008 - Dec 2011 **Bachelor in Biomedical Engineering** Univ. Politecnica delle Marche
  - Supervisor(s):** Prof. Sandro Fioretti

## Authored Open Source Software

- Occiput** Occiput Tomographic vision - AI/ML for tomographic image acquisition and reconstruction, in Python (*co-authored with others*)  
[<https://github.com/TomographyLab/Occiput>]
- gpuKMfit** GPU-CUDA toolbox for fitting compartmental models to 4D medical dynamic volumes, using MAP-LM optimization implemented with pyCUDA and cuBLAS.  
[<https://github.com/mscipio/gpuKMfit>]
- KMtoolbox** Kinetic Modeling Toolbox designed to estimate kinetic parameters from 4D PET and DCE-MRI dataset at a ROI level, in MATLAB.  
[<https://github.com/mscipio/KMtoolbox>]

## Selected Journal Publications

- **M Scipioni**, S Pedemonte, MF Santarelli, L Landini "Probabilistic Graphical Models for dynamic PET: a novel approach to direct parametric map estimation and image reconstruction", IEEE Transactions on Medical Imaging, (early access), 2019.
- **M Scipioni**, A Giorgetti, D Della Latta, S Fucci, V Positano, L Landini, MF Santarelli "Direct parametric maps estimation from dynamic PET data: an iterated conditional modes approach", Journal of Healthcare Engineering, 21, 2018.
- **M Scipioni**, A Giorgetti, D Della Latta, S Fucci, V Positano, L Landini, MF Santarelli "Accelerated PET kinetic maps estimation by analytic fitting method", Computers in biology and medicine, 99, 221-235, 2018.
- OA Catalano, L Umutlu, N Fuin, ML Hibert, **M Scipioni**, S Pedemonte, M Vangel, AM Catana, K Herrmann, F Nensa, D Groshar, U Mahmood, BR Rosen, C Catana "Comparison of the clinical performance of upper abdominal PET/DCE-MRI with and without concurrent respiratory motion correction (MoCo)". Eur J Nucl Med Mol Imaging, 45(12), 2147-2154, 2018.
- N Fuin, OA Catalano, **M Scipioni**, LPW Canjels, D Izquierdo, S Pedemonte, C Catana "Concurrent Respiratory Motion Correction of Abdominal PET and DCE-MRI using a Compressed Sensing Approach", Journal of Nuclear Medicine, 59(9), 1474-79, 2018.
- MF Santarelli, N Vanello, **M Scipioni**, G Valvano, L Landini "New Imaging Frontiers in Cardiology: Fast and Quantitative Maps from Raw Data", Current pharmaceutical design, 23 (22), 3268-3284, 2017.
- MF Santarelli, D Della Latta, **M Scipioni**, V Positano, L Landini "A Conway-Maxwell-Poisson (CMP) model to address data dispersion on positron emission tomography", Computers in biology and medicine, 77, 90-101, 2016.

## Selected Conference Presentations

- **M Scipioni**, "Direct 4D PET reconstruction with discrete tissue types", 41th Annual Intl. Conf. of IEEE Engineering in Medicine and Biology Society (EMBC), July 2019.
- **M Scipioni**, N Fuin, JC Price, OA Catalano, C Catana, "A kinetic-guided compressed sensing approach for DCE-MRI reconstruction", ISMRM 27<sup>th</sup> Annual Meeting & Exposition, May 2019.
- **M Scipioni**, MF Santarelli, L Landini, C Catana, DN Greve, JC Price, S Pedemonte, "Kinetic compressive sensing", 2017 IEEE Nuclear Science Symposium and Medical Imaging Conference (IEEE NSS/MIC) (pp. 1-5), Oct 2017.
- **M Scipioni**, N Fuin, MF Santarelli, L Landini, OA Catalano, C Catana, DN Greve, JC Price, S Pedemonte "Kinetic compressive sensing: improving image reconstruction and parametric maps", A.A. Martinos Center Scientific Open House, May 2017.
- **M Scipioni**, MF Santarelli, V Positano, L Landini, "The Influence of Noise in Dynamic PET Direct Reconstruction", XIV Mediterranean Conference on Medical and Biological Engineering and Computing, 308-313, Apr 2016.
- **M Scipioni**, MF Santarelli, A Giorgetti, V Positano, S Fucci, L Landini, "Pharmacokinetic analysis of dynamic PET data: comparison between direct parametric reconstruction and conventional indirect voxel-based estimation", XI European Molecular Imaging Meeting, March 2016.

Date August 1, 2019



## Soft Skills

### Social & Communication Skills

- Active listener, eager to learn.
- Clear and concise (oral), precise and attentive to detail (written).
- Verbal/Non-verbal communication, teamwork and public speaking skills built both in academia and working as trainer in competitive swimming.
- Ability to handle large number of people and stressful environments (several years working as lifeguard).

### Organization & Leadership Skills

- Leadership and decision-making (lead several groups of students for academic projects; mentored undergrads preparing their thesis project).
- Ability to work both independently and in team; responsibility and trustworthiness.
- Flexibility and adaptability, always willing to listen for criticism, and to give suggestions and support.

## Certificates

- **Test Of English as a Foreign Language (TOEFL)** [April 2016]:  
105 / 120 - European lvl: C2
- **Certificate level of Spanish as a foreign language** [February 2015]:  
European lvl: A1
- **European Computer Driving License (ECDL)**

## Interests

I strongly believe in continuous learning, enjoying spending spare time experimenting and studying new topics (mostly related to CS and ML), expanding my knowledge and skill base.

I also like to dedicate myself to amateur editing of images and videos, and to the creation of websites, putting into practice a bit of self-taught knowledge. I studied piano for 8 years, but now playing is mostly a hobby.

I have also worked as a swimming instructor and lifeguard for a few years during my undergraduate studies to support family expenses, after nearly 15 years of competitive swimming.