Michele Scipioni

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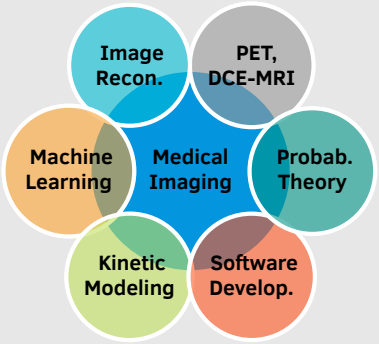
Main Skills



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 Skills

Italian

English

Spanish

About me

During the past 4 years, I have worked in the field of medical imaging while doing research towards a PhD in Biomedical Engineering, and now as a postdoctoral research fellow. These years of academia have allowed me to study and experiment with probabilistic modeling, algorithm design, 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. I would welcome the possibility to keep working on healthcare-related problems.

Experience

Nov 2019 - today
Postdoctoral Research Fellow — Martinos Center for Biomedical Imaging
- Developing and evaluating a new high performance 7-Tesla MR-compatible dedicated brain PET scanner. Developing and evaluating algorithms and software for image reconstruction and kinetic modeling of DCE-MRI and PET data.

Supervisor(s): C Catana, MD, PhD

Jan 2019 - Oct 2019
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): MF Santarelli, PhD

Jan 2017 - Jul 2017
Graduate Research Assistant — Martinos 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): S Pedemonte, PhD; JC Price, PhD; DN Greve, PhD

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

Supervisor(s): MF Santarelli, PhD

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, PhD

Education

Nov 2015 - Oct 2018
Ph.D. *with honors* in Biomedical Engineering — University of Pisa
Thesis: 4D tomographic image reconstruction and parametric maps estimation: a model-based strategy for algorithm design using Bayesian inference in Probabilistic Graphical Models (PGM)
Tasks: Model design, inference algorithm derivation, software development, writing scientific publications and presentations.
Supervisor(s): Prof. L Landini, PhD; MF Santarelli, PhD

Oct 2012 - Apr 2015
M.Sc. in Biomedical Engineering — University of Pisa
Supervisor(s): Prof. L Landini, PhD; MF Santarelli, PhD

Oct 2008 - Dec 2011
Bachelor in Biomedical Engineering — Univ. Politecnica delle Marche
Supervisor(s): Prof. S Fioretti, PhD

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, vol. 39, no. 1, pp. 152-160, Jan. 2020.
- **M Scipioni**, MF Santarelli, A Giorgetti, V Positano, L Landini "*Negative binomial maximum likelihood expectation maximization (NB-MLEM) algorithm for reconstruction of pre-corrected PET data*". Computers in Biology and Medicine 115 (2019): 103481.
- **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, 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^{th} 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**, 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 March 15, 2020

Awards

- [2019] ***"D.I.I."* award for the best doctoral thesis** (GNB)
- [2018] **NVIDIA GPU Grant Program**
- [2017] **Trainee Grant Program** (IEEE NSS-MIC)
- [2016, 2017] **Grant supporting Graduate TA position** (DII, UniPI)
- [2015] **3 years PhD scholarship** (DII, UniPI)

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.

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.