Michele Scipioni

Biomedical Engineer, M.Sc.

(+39) 320 247 5453

mscipio.github.io

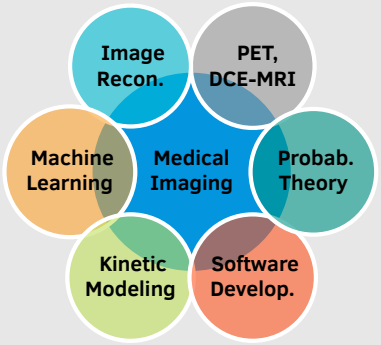
scipioni.michele@gmail.com

/in/scipionimichele

mscipio

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 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 computer vision and for programming. 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.

Education

Nov 2015 - Oct 2018 — **Ph.D. Candidate (*awaiting for defense*)** — 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 4D PET image reconstruction incorporating kinetic modeling and clustering; design of strategies for improving maps' SNR and accelerating voxelwise fitting via GPU parallelization; PET reconstruction algorithm for non-Poisson data; adapting approaches developed for PET to DCE-MRI.

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

Experience

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).
- Use of vendor software (*E7tools*) for pre-processing and validation of the in-house developed PET/MR reconstruction suite .
- Design of acquisition protocols for T1-mapping and simultaneous PET/DCE-MRI scan on *Siemens Biograph mMR*.

Supervisor(s): Dr. S. Pedemonte, Dr. J.C. Price, Dr. D.N. Greve

Nov 2016 - Dec 2018 — **Graduate Teaching Assistant** — University of Pisa

- TA for 248II (Biomedical Imaging) course for graduate students
- Mentoring 2 students during their master thesis research

Awards: University grant supporting TA position (2016 & 2017).

Supervisor(s): Dr. Maria Filomena Santarelli

Apr 2015 - Nov 2015 — **Intern @ Molecular Imaging Department** — Fondazione "G. Monasterio"

- Use of workstations (GE Discovery RX PET/CT) for acquisition, reconstruction and processing of NM data
- Validating protocols for acquisition and processing of dynamic data in a clinical setting, and implementation of command-line Linux scripts for anonymization and remote transfer of raw data
- Development of in-house software (KMtoolbox) for kinetic analysis of dynamic PET sequences.

Supervisor(s): Prof. Luigi Landini

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 Publications

[1] **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.

[2] **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.

[3] 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.

[4] 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), 1474-1479, 2018.

[5] 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.

[6] 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.

Conferences & Workshops

[1] **M Scipioni**, MF Santarelli, L Landini, C Catana, DN Greve, JC Price, S Pedemonte "*Kinetic compressive sensing*", In 2017 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC) (pp. 1-5). IEEE, 2017.

[2] **M Scipioni**, N Fuin, MF Santarelli, L Landini, OA Catlano, C Catana, DN Greve, JC Price, S Pedemonte "*Kinetic compressive sensing: improving image reconstruction and parametric maps*", Athinoula A. Martinos Center for Biomedical Imaging Scientific Open House, 25 May, Boston, 2017.

[3] **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 2016, 308-313, 2016.

[4] **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 8-10 March, Utrecht, 2016.

Date December 11, 2018

Signature 

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 even in contexts of emergency (several years working as lifeguard).

Organization & Leadership Skills

- Leadership and decision-making (lead different groups of students for academic projects).
- 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.