RUDY RIZZO

he/him

address: 1818 Jackson Avenue, Ann Arbor, MI, 48103, USA
e-mail: rudy.rizzo.tv@gmail.com
phone: +1 734 496 5882
nationality and DOB: Italian, 19 May 1994
documents: H1B visa holder, driving license
website: bellarude.github.io/Portfolio/

Nuclear Magnetic Resonance Scientist, Deep Learning Engineer, Data Scientist, Researcher

Education

2023 Ph.D. in Biomedical Engineering
University & University Hospital Bern
Bern, Switzerland — GPA 4.00/4.00
magna cum laude

2019 M.Sc. in Biomedical Engineering
University of Padova
Padova, Italy — GPA 4.00/4.00
summa cum laude

2016 B.Sc. in Information Engineering
University of Padova
Padova, Italy — GPA 3.46/4.00

2013 Technical High School Institute
Technical Institute A. Palladio
Treviso, Italy — GPA 4.00/4.00

Soft Skills

- Project management ★★☆
- Decision making ★★☆
- Problem solving ★★★
- Logical thinking ★★☆
- Creativity ★★★
- Adaptability ★★★
- Intuition ★★★
- Teamwork ★★☆

Technical Skills

- AI/Deep Learning ★★☆
- Data Analysis ★★★
- NMR physics ★★★
- Python ★★★
- MATLAB ★★★
- Java ★☆☆
- C/C++ ★☆☆
- Latex ★★☆
- Office Suite ★★☆
- Adobe Suite ★☆☆

and where there is no knowledge,
there is dedication to learn

Languages

Italian	mother tongue
English	C2 (oral and written)
German	B1 (oral and written)

Summary

Ph.D. in biomedical engineering with a focus on nuclear magnetic resonance (NMR) physics and artificial intelligence applied for medical imaging and spectroscopy. My expertise spans quantitative multi-parametric MR imaging (MRI) and spectroscopy (MRS), the physics and mathematical preparation of radio-frequency pulse sequences, and clinical translation for MRI, linking theoretical applications of physics to engineered patient care. I am skilled in the mathematical modeling and quantification of biological data, with a keen focus on accuracy and uncertainty measures. My research also explores the application of machine learning, particularly deep learning, for quantification purposes, highlighting its reliability and robustness compared to traditional methods.

Experience

Research fellow - Postdoc

September 2023 – current

Department of Radiology, University of Michigan
Ann Arbor, Michigan, United States

Designed NMR radio-frequency sequences for the acquisition of human body imaging using both open-source and proprietary software. Mathematically optimized fast imaging methods by creating unique frequency sampling trajectories, tailored RF pulses, and enhancing NMR signal modulation and contrast. Developed MRI methods for qualitative morphological, structural, and functional imaging, as well as noninvasive quantitative multiparametric purposes. Advanced MRI reconstruction techniques using parallel imaging, compressed sensing, AI-driven methods, and motion detection/correction algorithms. Analyzed algorithm performance and quantitative outcomes, including statistical evaluations. Conducted imaging investigations of the brain, lungs, heart, and abdomen. Envisioning innovative solutions to expand MR imaging accessibility by improving and advancing the technology of the next generation of commercial whole-body low-field strength MR scanners. Supervised PhD and Master's students. Authored scientific papers and delivered presentations at academic journals, conferences, and workshops. Experienced in grant writing and scientific review for international societies of experts in the field of NMR for medicine and biology.

Research fellow - Ph.D.

May 2019 – May 2023

Department of Neuroradiology, University of Bern
Bern, Switzerland

Pioneered NMR radio-frequency sequences for fast multiparametric MRS and spectroscopic imaging (MRSI) acquisition with a focus on simultaneous estimation of metabolomics content, NMR relaxation times, and tissue diffusivity properties. Acquisition of NMR data, postprocessing, complex mathematical modeling, data analysis, and quantification

Date: 22 July 2024, Rudy Rizzo

Certificates

- 12.2021: Start-Up Business Concept training*, Innosuisse*, Bern, Switzerland
- 09.2019: IDEA MR radiofrequency pulse Sequence Programming, *Siemens Healthineers*, Erlangen, Germany

Awards

- Reviewer for the International Society of Magnetic Resonance in Medicine (ISMRM) and European Society of Magnetic Resonance in Medicine and Biology (ESMRMB) for years: 2023, 2024
- ISMRM 2023: Summa Cum Laude abstract (top 5%) entitled: Simultaneous concentration and T_2 mapping of brain metabolites by multi-echo spectroscopic imaging.
- ISMRM 2023: 3rd best poster at MR Spectroscopy Study Group entitled: Physics-informed deep learning approach to quantifying MR spectroscopy data with simultaneous uncertainty estimation
- ISMRM 2023: 2nd best poster at Diffusion Study Group entitled: Diffusion-weighted MR spectroscopy of the prostate
- Moderator at the MRS Workshop 2022, endorsed by ISMRM
- ERASMUS +study (2018, 6 months)
- ERASMUS +mundus (2019,9 months)
- Marie-Curie ITN fellowship (3 years)
- Three ISMRM educational stipends (2020, 2021, 2022)

Volunteering

- ISMRM MRS study group: organization of *meet the expert* sessions at the MRS workshop 2022.
- Night of the Research: promoting research at the University of Bern with children and family, tailoring game and distilling basic knowledge on Magnetic Resonance together with current line of research.
- Erasmus Student Network: organizing and supervising events to gather and welcome international students and guests. Roles: section of Bern member (2019 – 2022), event manager (2020-2021), president (2021-2022), advisory council (2022).

Hobbies

- Dungeons & Dragons
- Boardgames & puzzles
- Hiking and running
- Travelling
- Cooking

Implementation and analysis of deep learning algorithms for quantification and denoising of MRS data with interests in interpretability, reliability, and robustness. Conducted MRS investigations of the human brain and prostate. Authored scientific papers and delivered presentations at academic journals, conferences, and workshops as well as talks for lay-audience.

Visiting research fellow

April 2022 – June 2022

Department of Radiology, Radboud University Medical Center
Nijmegen, The Netherlands

Facilitated collaborative research efforts with the partner institution to broaden the scope and impact of ongoing projects in prostate imaging and noninvasive body quantitative analysis, demonstrating a commitment to cross-functional academic partnerships. Garnered significant experience within clinical environments, including preparing ethical research proposals for institutional review boards, fostering productive interactions with healthcare professionals, and handling pathological case data with sensitivity and accuracy.

Researcher - M.Sc.

Aug 2018 – Mar 2019

Electro-Medical Fusion Lab, Seoul National University
Seoul, South Korea

Design of spatiotemporal real-time random Markov processes for the online simulation and modeling of microscopical fixational eye movements to be integrated into vision prosthetic devices and towards improving image recognition and restoring eye mobility in vision-impaired patients. Development of stand-alone software and graphical user interfaces. Design of experiment setup, data collection, statistical analysis, and algorithm performance evaluation.

Researcher– M.Sc

Feb 2018 – Jul 2018

Technische Universität Graz
Graz, Austria

Collaboration with international fellows on research and teaching projects. Fostering of scientific writing and oral skills in English and German. Fine-tuning of machine learning algorithms for Brain-Computer Interfaces, mathematical modeling for brain computation and neuronal modeling, and artificial intelligence for neuro-engineering, rehabilitation, and prosthetic devices. Data and statistical analysis. Scientific manuscript writing.

Researcher - B.Sc.

Feb 2016 – Sep 2016

Department of Industrial Engineering, University of Padova
Padova, Italy

Simulation of 3D-finite-element current fluxes and related magnetic fields upon variation of the inclination of medical device's electrodes, size, and voltage for medical purpose devices. Experimental setup and investigation of electroporation on human skin for medical purposes with in-vivo tests based on plant models. Data and statistical analysis. Scientific manuscript writing.

Scientific Output

Co-authored 7 scientific manuscripts in top-tier medicine, engineering, and physics journals. Co-authored 15 international conference proceeding manuscripts. Invited to 4 scientific talks and seminars.
h-index: 4, i10-index: 2, 47 citations, ORCID: 0000-0003-4572-5120, Google Scholar

Date: 22 July 2024, Rudy Rizzo