V. Franco Matzkin

AI & Computer Vision Specialist
fmatzkin@sinc.unl.edu.ar — http://sinc.unl.edu.ar/staff/franco-matzkin/

PROFESSIONAL SUMMARY

Experienced AI and Computer Vision specialist with a strong background in deep learning, medical imaging, and software engineering. As an assistant teacher and PhD candidate at sinc(i), my work over the past five years has focused on AI and medical imaging, particularly in applying deep learning to enhance diagnostic accuracy. While my expertise is deeply rooted in these fields, I am also open to exploring opportunities in other areas that align with my broad training as a Computer Engineer, which includes competencies in software development, digital systems, and data management.

PROFESSIONAL EXPERIENCE

AI Research Engineer 2019 - Present
sinc(i), Santa Fe, Argentina

- Developed deep learning models for skull reconstruction and implant generation in CT images, improving cranioplasty procedures.
- Implemented model calibration techniques to reduce uncertainty in segmentation models, enhancing diagnostic reliability.
- Utilized technologies including PyTorch, OpenCV, MLflow, NumPy, Keras, Pandas, and Scikit-learn in various projects.
- Collaborated on international research projects, resulting in publications in top-tier conferences and journals.
- Mentored junior researchers and supervised undergraduate thesis projects in AI and medical imaging.

Teaching Assistant 2022 - Present
Facultad de Ingeniería y Ciencias Hídricas (UNL), Santa Fe, Argentina

- Lead Teaching Assistant for the Programming Technologies course for 3rd-year Computer Engineering students.
- Instruction in programming paradigms, including Object-Oriented Programming (Java, Python), Functional Programming (Scheme), and Logic Programming (Prolog).
- Development of educational materials and practical guides to support students' learning across different paradigms.
- Supervision and mentorship of programming projects, ensuring the application of advanced concepts in real-world practices.

Research Intern Jan 2023 - Jul 2023
École de technologie supérieure (ÉTS), Montreal, Canada

- Conducted research on advanced AI techniques at the LIVIA laboratory, focusing on medical imaging applications (novel approaches for uncertainty quantification in deep learning models for medical diagnosis).
- Participated in the "Emerging Leaders in the Americas Program" sponsored by the Canadian government.

Software Engineering Intern Jan 2019 - Feb 2019
Auravant, Buenos Aires, Argentina

- Developed image segmentation algorithms using computer vision and deep learning techniques for agricultural applications.
- Improved crop analysis efficiency through automated image processing pipelines.

QUALIFICATIONS

AI & Machine Learning: Deep Learning, Neural Networks, (**PyTorch, TensorFlow, Keras, Scikit-learn, MLflow**), Computer Vision (**OpenCV**), Transformer Models, Uncertainty Quantification

Medical Imaging: CT, MRI, X-ray analysis, Image Segmentation (**U-Net**), Medical Image Processing (**SimpleITK**), Image Registration (**SimpleElastix, ANTs**)

Programming & Development: Languages: (**Python, Java, C++, R, MATLAB, Scheme, Prolog**), Software Engineering Best Practices, Version Control (**Git**), Debugging & Refactoring

Data Science & Analytics: Data Processing & Modeling, Statistical Analysis, (**NumPy, Pandas, SciPy**)

High-Performance Computing: GPU Clusters, (**Slurm Workload Manager**), ssh

Programming Paradigms: Object-Oriented Programming, Functional Programming, Logic Programming

Database Systems (**SQL**)

Web Technologies: (**HTML, CSS, PHP**, base experience)

Tools & Environments: (**Jupyter Notebooks, Google Colab, LaTeX, Microsoft Office**)

Operating Systems: (**Linux, Windows**)

Soft Skills: Research & Publication, Mentorship & Teaching, Problem Solving, Teamwork & Collaboration

EDUCATION

Ph.D. in Engineering, Signals, Systems and Computational Intelligence
2019 - 2025 (Expected)
Universidad Nacional del Litoral, Argentina
Some of the courses taken:

- Software Design for Scientific Computing
- Selected Topics in Machine Learning
- Matrix Algebra for Data Science
- Advanced Signal Processing
- Computer Vision
- Applied Statistics
- Applied Mathematics

B.Eng. in Computer Engineering 2013 - 2019
Facultad de Ingeniería y Ciencias Hídricas (UNL), Argentina
Education in Computer Engineering covering various domains, including:

- Software Engineering
- Digital Electronics
- Digital Signal Processing
- Computational Mechanics
- Computer Graphics
- Computational Intelligence
- Image Processing

KEY PROJECTS

Automated Cranial Implant Design

- Developed a deep learning-based system for automatic skull reconstruction and implant generation in CT images using PyTorch.
- Improved efficiency and accuracy of cranioplasty procedures, potentially reducing surgical planning time.

Uncertainty Quantification in Medical Image Segmentation

- Implemented advanced calibration techniques for deep learning models to quantify and reduce uncertainty in medical image segmentation tasks.
- Enhanced the reliability of AI-assisted diagnoses in clinical settings.

PUBLICATIONS & PATENTS

Author of 3 peer-reviewed publications in international conferences and journals, including MICCAI and IEEE Transactions on Medical Imaging. (Google Scholar Profile)

PROFESSIONAL DEVELOPMENT

- Research Visit, University of Leeds, UK (July 2022)
- Research Visit, Ecole de technologie superieure, Canada (January to July 2023)
- Summer School on Internet of Things, National University of the South, Argentina (2018)
- Academic Exchange, Central University "Marta Abreu" de las Villas, Cuba (2016)

LANGUAGES

Spanish (Native), English (Full Professional), Italian (Full Professional), French (Basic)

ADDITIONAL INFORMATION

- Reviewer for Machine Vision and Applications (Springer, 2020) and International Journal of Computer Assisted Radiology and Surgery (Springer, 2021)