Martín Gramática

Applied AI Engineer | Computer Vision for Digital Pathology | AI Researcher & Lecturer

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Profile

Software engineer and applied AI specialist with 15+ years of experience, the last 6 building digital pathology software. At Smart In Media AG I am the technical lead of four digital pathology products (PathoZoom Scan & LiveView, LiveView Macro, RemoteScope and SmartGrossing) and responsible for AI in the company, from integrating external models into clinical workflows in .NET to in-house proofs of concept. In parallel, I have been an AI researcher at UTN since 2012, working on cytology and histopathology with current foundation models (UNI, BiomedCLIP, SAM2), with 11 publications including an Elsevier book chapter (2026). I also teach AI at UTN, where every year I design an end-to-end project around current industry techniques such as RAG, multimodal systems and image-to-text models.

Core Skills

- **AI & Deep Learning:** PyTorch, TensorFlow/Keras, scikit-learn, Transformers
- **Computer Vision:** detection, classification and segmentation; foundation models (UNI, BiomedCLIP, SAM2); OpenCV, EmguCV; high-resolution microscopy imaging
- **Generative & Multimodal AI:** LLMs, RAG, embeddings, vector search (FAISS, Chroma), multimodal pipelines
- **Software Engineering:** C#/.NET, Python, C++, SQL; architecture of desktop medical imaging applications
- **Tools & Practices:** Git, Docker, Kubernetes, CI/CD, Linux, Scrum/Kanban
- **Languages:** Spanish (native), English (fluent), German (basic)

Experience

Smart In Media AG – Digital pathology software
Technical Lead & AI Lead *2021 – Present*

- Technical lead for the PathoZoom product line: Scan & LiveView, LiveView Macro, RemoteScope and SmartGrossing, desktop and remote applications for digital pathology used in diagnosis, remote collaboration and teaching. Lead a team of 2 developers.
- Responsible for AI across the company: evaluate and integrate external AI models, and build small in-house developments and proofs of concept.
- Own the software architecture and technical roadmap of the products, adapting them to new needs in digital pathology and AI-assisted workflows.
- Integrate detection and classification models into .NET applications through intermediate services and modular components, so new AI features can be added robustly and maintainably.
- Handle real-time acquisition and processing of high-resolution microscopy images, optimizing performance in real clinical environments.

Computer Vision Engineer *2020 – 2021*

- Maintained and enhanced LiveView, a real-time microscope image-sharing application.
- Developed real-time image stitching for full-slide visualization.

National Technological University (UTN-FRC)
AI Teaching Assistant – Artificial Intelligence course *2024 – Present*

- Design and supervise the Integrative Practical Assignment (IPA): end-to-end AI systems built by senior engineering students under realistic resource constraints (Google Colab, Kaggle).
- Projects designed: **2024** object detection for chessboard analysis; **2025** text-based RAG; **2025** multimodal RAG over text and images (technical documents, figures, diagrams); **2026** automatic scene description (image-to-text).
- Evaluate solutions on system-level design, error analysis, robustness and hallucination mitigation.

AI Researcher – Computer Vision & Digital Pathology *2012 – Present*

- Research on AI for digital pathology and computer-aided diagnosis at the Software Research Laboratory (LIS).
- Cell detection, classification and nucleus segmentation in Pap smear cytology; tissue analysis in histopathology; image analysis for nephrology projects.
- Recent work with foundation models: UNI and BiomedCLIP for unsupervised nucleus detection, embedding

analysis for assisted segmentation, and learned mask selection for SAM2.
- Experimental design, model training and validation, and scientific writing; supervise undergraduate and graduate student teams.

Computer Vision Instructor – Data Science Diploma *2020 – 2021*

- Designed and taught the computer vision module: image processing, deep learning for vision and applied projects.

Earlier Experience

- **Freelance Computer Vision** / **ML Engineer** (2019 – 2020): visual search over 3D objects with autoencoders, audio pattern detection in advertising, object detection for behavior monitoring.
- **Full-Stack .NET Developer**, Cooperativa Integral Villa Carlos Paz (2013 – 2020): development and maintenance of the company's business systems (web, mobile, Oracle).
- **Head Teaching Assistant, Mathematical Analysis II**, UTN-FRC (2016 – 2018).
- **Java Developer**, Globant – contractor for Southwest Airlines (2013); **Test Automation**, Motorola / LIDICALSO (2012).

Publications

- **2026** – **Learned Candidate Mask Selection for Cell Nucleus Segmentation with SAM2: Evaluation on CCEDD.** Gramática M.N., García M.A., Carrizo I. CONAIISI 2026 – Congreso Nacional de Ingeniería Informática / Sistemas de Información (oral presentation).
- **2026** – **Embedding Analysis for Assisted Segmentation of Cervical Cytology.** García M.A., Gramática M.N. SAIV – 55 JAIIO, Argentina.
- **2026** – **Relationship between object detection and image classification stages in Pap test.** Gramática M.N., Pianzola G., Alfici H.D., García M.A. In: *Advances in Image Processing, Reliability, and Artificial Intelligence*, Elsevier, pp. 275–291. doi:10.1016/B978-0-443-34266-0.00016-4
- **2025** – **UNI y BiomedCLIP en la detección no supervisada de núcleos celulares en citología de Papanicolaou.** Gramática M.N., García M.A., Elmoni S., Ledesma L.O. XIII CONAIISI, Córdoba, Argentina.
- **2023** – **Intermediate Task Fine-Tuning in Cancer Classification.** García M.A., Gramática M.N., Ricapito J.P. *Journal of Computer Science & Technology*, 23(2):135–144.
- **2023** – **Conv Pap Detect: Enhancing Conventional Pap Smear Analysis with Deep Learning for Cell Detection and Classification.** Gramática M.N., García M.A., Ricapito J.P., Silva Fiezzi T. XI CONAIISI, S.M. de Tucumán, Argentina.
- **2023** – **Clasificación de células en prueba de Papanicolaou (pap test) en microscopía.** Gramática M.N., García M.A., Gignone M. 52 JAIIO – CAIS, Caseros, Argentina.
- **2023** – **Intermediate Task Transfer Learning and Weakly Supervised Training in Histopathology.** Gramática M.N., García M.A., Ricapito J.P. XI Conference on Cloud Computing, Big Data & Emerging Topics, La Plata, Argentina.
- **2022** – **Clasificación de tipos de cáncer en imágenes de histopatología.** García M.A., Gramática M.N., Rostagno L.A., Ricapito J.P. X CONAIISI, Concepción del Uruguay, Argentina.
- **2022** – **Clasificación de cáncer en histopatología: ¿Texturas o detalles de alto nivel?** Gramática M.N., García M.A., Rius B., Pucheta P., Luengo Ackermann R.B. JIS 2022, Buenos Aires, Argentina.
- **2022** – **Procesamiento automático de imágenes médicas.** García M.A., Gramática M.N. XXIV WICC, Mendoza, Argentina.

Education

MSc in Computer Vision, Robotics and Machine Learning (Distinction) *2018 – 2019*

University of Surrey, UK

Information Systems Engineer (GPA 8.71/10) *2007 – 2016*

National Technological University (UTN), Argentina

Scholarships: BEC.AR (MSc in the UK, 2018 – 2019); SAE-UTN and BINID-UTN research scholarships; 500x500 (Province of Córdoba).