ZIAD KHEIL

3rd Year PhD Candidate

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QUALIFICATIONS

PhD in Machine Learning for Healthcare

INSERM / IMT / Université de Toulouse

2022 – 2025 | Toulouse, France

- **Thesis:** Constrained Deep Learning for Deformable Image Registration: When Physics Meets Data.
- Designed physics-informed DL models leveraging biomechanical priors and multimodal breathing signals for adaptive radiotherapy.

MSc. Machine Learning & Artificial Intelligence

Imperial College London

2020 – 2021 | London, UK

Engineering Degree (Applied Mathematics and Decision Theory)

ISAE–SUPAERO

2018 – 2022 | Toulouse, France

Preparatory Classes (MP*)

Lycée Michel de Montaigne

2015 – 2018 | Bordeaux, France

RESEARCH EXPERIENCE

PhD Researcher

INSERM / IMT / Université de Toulouse

2022 – Ongoing | Toulouse, France

- Developed physics-aware and constraint-driven DL methods for deformable registration and artefact-free 4D-CT reconstruction.
- Collaborated with clinicians to apply and validate models on in-house patient datasets.

Research Internship: Robust Object Detection with Lipschitz Networks

IRT Saint-Exupéry / DEEL

2022 | Toulouse, France

- Integrated Lipschitz-constrained networks into object detection for provable robustness.

Teaching

ISAE–SUPAERO, Université de Toulouse, Toulouse Tech

2022 – 2025

- Courses: statistics, AI, deep learning, signal processing, computer vision, Python, and R.

Supervision

INSERM / IMT / Université de Toulouse

2023 – Ongoing

- M1: methylation-based tumor subtype classification.
- M2: RLHF for deep-learning image registration.

"Stories of imagination tend to upset those without one."
– Terry Pratchett

HIGHLIGHTS

- **2nd Place – VisioMel Challenge** (2023): Developed relapse prediction models from whole-slide histopathology images.
- **Finalist – Owkin Spatial Transcriptomics Hackathon** (2022): Leveraging spatial transcriptomics data.
- **Invited Speaker & Presenter:** Oral presentations at ISBI and ESTRO (2024–2025) on DL for medical imaging.

SKILLS

Deep Learning | Medical Imaging | Deformable Registration | PyTorch | Python | Statistical Analysis | Reinforcement Learning | Git | C | Java

LANGUAGES

English	Native Speaker	●●●●●
French	Native Speaker	●●●●●
Arabic	Native Speaker	●●●●○
Spanish	B2	●●●○○

HOBBIES

Photography & Video Editing
Allying creativity with technique.

Chess
Passionate amateur; active player on chess.com.

PUBLICATIONS

1. **Z. Kheil**, L. Robinet, L. Risser, S. Ken, "**IMITATE: Image Registration with Context for Unknown Time Frame Recovery**," in *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2025.
2. **Z. Kheil**, S. Ken, L. Risser, "**Biomechanical Constraints Assimilation in Deep-Learning Image Registration: Application to Sliding and Locally Rigid Deformations**," *arXiv preprint arXiv:2504.05444*, 2025.
3. **Z. Kheil**, S. Ken, L. Risser, "**Deep-Learning Deformable Image Registration for 4DCT/3DMRI Label Propagation**," in *Radiotherapy and Oncology*, vol. 194, pp. S4478–S4481, 2024.
4. L. Robinet, **A. Berjaoui**, **Z. Kheil**, E. Cohen-Jonathan Moyal, "**DRIM: Learning Disentangled Representations from Incomplete Multimodal Healthcare Data**," in *Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 2024.
5. P. Deshors, **Z. Kheil**, L. Ligat, V. Gouazé-Andersson, et al., "**FGFR Inhibition as a New Therapeutic Strategy to Sensitize Glioblastoma Stem Cells to Tumor Treating Fields**," *Cell Death Discovery*, vol. 11, 265, 2025.
6. C. Dahdah, C. Van Leeuwen, **Z. Kheil**, J. Lacan, J. Detchart, T. Gateau, "**Enabling Monetization of Depreciating Data on Blockchains**," in *Proc. Int. Conf. on Information Systems Security and Privacy (ICISSP)*, 2021.