GAËTAN DESRUES *Ph.D.*

Full–Stack R&D Engineer

in LinkedIn | ○ GitHub | ✉ gdesrues@gmail.com

Skills

- Python | C++ | JavaScript (React, TypeScript) | API Integration | PostgreSQL | MongoDB | Git | Docker, Kubernetes
- Cloud Platforms: AWS, GCP, Azure | Supabase | DevOps | Full-Stack & Web Development | IoT
- Mathematical Modeling | FEM | Numerical Simulation | HPC | Personalisation | Digital Twins | R&D | French, English

Experience

| **Postdoctoral Researcher** | **INRIA** | *Sophia-Antipolis* | **2025 -** present |

- Developing 3D electromechanical cardiac models to improve the understanding of heart function and assist in treatment planning for heart failure patients. Using SOFA framework on Inria's national computing infrastructure
- Developing patient-specific preoperative planning tool for transcatheter mitral valve repair

Freelance Consultant | Web, Data Science, Cloud & Digital Transformation   **2025 -** present

- Project manager: leading development of custom web and AI solutions - from business needs analysis to cloud deployment, and beyond
- Full-stack developer & project lead: Led end-to-end development of a custom client portal with AI-driven recommendations and virtual assistant. Built using Next.js, Supabase, and secure cloud infrastructure, (2024 - present)
- Full-stack developer: built an itinerary booking app, integrating Google and OpenAI APIs, using Kubernetes, ReactJS and FastAPI, (2023)

| **PhD in Computer Engineering** | **INRIA - Microport CRM** | *Sophia-Antipolis - Paris* | **2020 - 2023** |

- My research focused on using digital twin technology to predict responses to Cardiac Resynchronization Therapy (CRT). This thesis demonstrates the feasibility of implementing AI-based methods to create and personalize a biophysical heart model from clinical data
- Participated in **conferences**, poster sessions, presentations and **talks**. Involved in the **SimCardioTest** European Research Project
- Designed and implemented a **Python/C++** framework for cardiac simulation, deployed the computations in the INRIA and **Azure** clouds

Education

- **Research Internship** : Building a reduced cardiac finite element model based on poly-affine deformation. The model is developed using SOFA framework in python and C++, **(INRIA, Sophia-Antipolis, 2019)**
- **Master in Mathematical Modeling**: major in Fluid Mechanics and **High Performance Computing** at ENSEIRB-MATMECA engineering school. Studying differential calculus, Lagrange's method and variational calculation, **(Bordeaux, 2016 - 2019)**
- 2-year intensive math and physics preparatory class (**PCSI - PSI**) in Lycée Bellevue, **(Toulouse, 2014 - 2016)**
- **Teaching assistant**: conducted tutorial sessions on linear equations for Master's level students, **(Nice University, 2020)**

Projects

- Developed and applied deep learning models (CNN) to detect soft tissue sarcoma in MRI scans, enhancing diagnostic accuracy through AI-powered image recognition. Working with Inria team Monc, **(INRIA, Bordeaux University, 2019)**
- Modeling the propagation of a tidal bore wave propagating upstream a river (mascaret) using C++, Gmsh, Paraview and Fluent. Modelisation with unstructured mesh in 3D with the shallow water equations, **(Bordeaux University, 2017)**

Publications

- Gaëtan Desrues. *Personalised 3D electromechanical models of the heart for cardiac resynchronisation therapy planning in heart failure patients.* Theses, Université Côte d'Azur, **(03/2023)**
- Jairo Rodriguez, Gaëtan Desrues, Delphine Feuerstein, Thierry Legay, Serge Cazeau, and Maxime Sermesant. *Electromechanical output as function of APD: a cardiac personalized simulation study.* In World Congress of Biomechanics, Taipei, Taïwan, **(06/2022)**
- Gaëtan Desrues, Delphine Feuerstein, Thierry Legay, Serge Cazeau, and Maxime Sermesant. *Personal-by-design: a 3D Electromechanical Model of the Heart Tailored for Personalisation.* In Functional Imaging and Modeling of the Heart, Stanford, CA, United States, **(06/2021)**
- Gaëtan Desrues, Hervé Delingette, and Maxime Sermesant. *Towards Hyper-Reduction of Cardiac Models using Poly-Affine Deformation.* In Statistical Atlases and Computational Models of the Heart. STACOM 2019: Statistical Atlases and Computational Models of the Heart, Shenzhen, China, **(10/2019)**