Thomas Saigre

Research Engineer at Université de Strasbourg

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Employment History

2024 – present	**Research Engineer,** Cemosis, Institut de Recherche Mathématique Avancée, Université de Strasbourg.
2021 – 2024	**PhD. student,** Institut de Recherche Mathématique Avancée, Université de Strasbourg.

Education

2021 – present	**Ph.D., Université de Strasbourg,** Institut de Recherche Mathématique Avancée. Thesis title: *Mathematical modeling, simulation and reduced order modeling of ocular blood flows and their interactions: Building the Eye's Digital Twin.*
2019 – 2021	**Master Calcul Scientifique et Mathématiques de l'Information,** Université de Strasbourg. (Mention Très Bien) Data processing, learning algorithms, Signal processing, Modeling / Simulation / Optimization, High performance computing
2017 – 2021	**Magistère de Mathématique,** Université de Strasbourg. (Mention Bien)
2015 – 2017	**Classe Préparatoire aux Grandes Écoles,** Lycée Camille Guérin, Poitiers. MPSI/MP* (Mathématiques, Physique et Sciences de l'Ingénieur)

Teaching

2021 – 2024	**Scientific Computing,** Université de Strasbourg, L2 Tutorial, practical work in Python.
	Cercle Mathématique de Strasbourg. Structure for high-school students taking place in the laboratory once a week.
2021 – 2022	**Applied numerical analysis,** Université de Strasbourg, L2 Tutorial, practical work in Scilab.
2021, 2024	**Khôlles of Mathematics,** Université de Strasbourg and Lycée Kléber, L1 / MPSI

Research Publications

Journal Articles

1. T. Saigre, C. Prud'homme, and M. Szopos, "Model order reduction and sensitivity analysis for complex heat transfer simulations inside the human eyeball," *International Journal for Numerical Methods in Biomedical Engineering,* vol. 40, no. 11, e3864, 2024. 🔗 DOI: https://doi.org/10.1002/cnm.3864.

Pre-prints

1. S. Bertoluzza, C. Prud'homme, T. Saigre, and M. Szopos, "Low to high order finite element resolution for elliptic problems in the presence of a Dirac source term," In preparation, Jun. 2024.

2 P. J. Hossie, B. Laroche, T. Malou, L. Perrin, T. Saigre, and L. Sala, "Simulating interactions in microbial communities through Physics Informed Neural Networks: towards interaction estimation," Submitted, Feb. 2024. 🔗 URL: https://hal.inrae.fr/hal-04440736.

3 T. Saigre, C. Prud'Homme, M. Szopos, and V. Chabannes, "A coupled fluid-dynamics-heat transfer model for 3D simulations of the aqueous humor flow in the human eye," In preparation, Jun. 2024.

Peer reviewed conference proceedings

1 T. Saigre, C. Prud'Homme, M. Szopos, and V. Chabannes, "A coupled fluid-dynamics-heat transfer model for 3D simulations of the aqueous humor flow in the human eye," in *8th International Conference on Computational and Mathematical Biomedical Engineering – CMBE2024 Proceedings*, P. Nithiarasu and R. Löhner, Eds., Arlington (Virginia), United States, Jun. 2024. 🔗 URL: https://www.compbiomed.net/2024/cmbe-proceedings.htm.

Skills

Applied Mathematics

Modelisation	🔖 Partial differential equations, ordinary differential equations, optimization, control theory …
Simulation	🔖 Finite element method, Reduced Order Modelling, sensitivity analysis …

Coding

Python	🔖 NumPy, Plotly, tensorflow, Keras …
C/C++	🔖 Standard library, MPI, …
Other	🔖 LaTeX, Julia, OCaml …

Miscellaneous Experience

2022-2023	🔖 Co-organizer of the **PhD seminar** at IRMA.
	🔖 Member of the **Young Researcher Comitee** of the ITI IRMIA++.

TFJM²

2023, 2021, 2018	🔖 Member of the Local Organization Comitee of the **Tournoi Français des Jeunes Mathématiciennes et Mathématiciens**.
2023, 2024	🔖 Supervision of the team Cercle Mathématiques de Strasbourg.

Scientific animation and mediation

2024, 2023	🔖 Supervision of a research workshop at **Rendez-vous des Jeunes Mathématiciennes et Informaticiennes** in Strasbourg.
2023, 2022	🔖 **Fête de la science :** Animation of the Enig'maths course and the IRMA stand on the cube and its bosses.