Daniel MARGERIT

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Daniel-Margerit
danielmargerit

Research and Modeling Engineer

"Modeling your complex systems."

With 20 years of experience as a consultant in the Aerospace industry, I possess strong expertise in analyzing and modeling the functional requirements of complex systems. With 10 years of research and teaching in fluid mechanics, I have solid expertise in modeling and scientific computing.

Key Skills

- Physical and Mathematical Modeling
- Specification (UML, Archimate) and Formalization
- DoE Methods, MDAO, Data Science, RUP, MBSE
- Development in Python, Matlab, Fortran, C++
- Technical Project Management

Qualities

- Analytical and Creative Mindset
- Rigor and Perseverance
- Adaptability and Communication

Aeronautical Industry Consultant Engineer

2020 – Present **Data Science and MDAO Engineer**, *Capgemini*, Toulouse
- MDAO study using gemseo, SoSTrades, OpenVSP, and Python
- Functional mapping of an MDAO platform and design of a mock-up interface (6 months)
- Regression, classification, surrogate models, DoE, MDAO with scikit-learn and gemseo (1 year)

2011 – 2020 **Structural Engineer**, *Capgemini*, Toulouse
- Monitoring and verification of structural maintenance documents for Airbus (6 years)
- Joint studies using ISAMI and support justification in Nastran for the A350 (Sogerma project)
- Patran/Nastran simulation on the Frame 40 (Airbus project)

2010 – 2023 **Python and Matlab Developer**, *Capgemini*, Toulouse
- Python development for MDAO within the Airbus SoSTrades team (10 months)
- Development of Python scripts for Abaqus and Scilab (R-curve in fatigue) for Airbus
- Maintenance of Matlab tools for post-processing vibrational results at Airbus
- Maintenance of aerospace and mechanical optimization chains using Python with Optimus for M&T Snecma

2007 – 2016 **Occasional Trainer**, *Capgemini*, Toulouse
- Training Airbus structural calculators on *ISAMI Static* and *Metallic Static Strength*

2004 – 2024 **Business Analyst**, *Capgemini*, Toulouse
- Valorization of research for CIR (6 months)
- Capture and analysis of Airbus Tech Data processes using Archimate
- Modeling of requirements and data in UML for the Airbus Digital Stress Dossier project
- Writing requirements documents for Airbus's M&T Structure Department
- UML specifications with Topcased/Papyrus for Airbus's e-logbook project
- Business responsible for the Caesam/Python Framework of Airbus's ISAMI tool, a transnational integration tool for structures (6 years)

Researcher and Teacher

2003 – 2004 **Research Engineer**, *CERFACS*, Toulouse
- Numerical computing with Elsa and implementation of a new boundary condition in C++ and Python

2000 – 2002 **Researcher**, *IMFT*, Toulouse
- Development of a 3D simulation software in C (European CWAKE project on the A380 wake)
- Trainer at CNAM Toulouse for evening courses on *Numerical Methods in Aerodynamics*

1998 – 2000 **Postdoctoral Researcher**, *Mathematics Institute, Warwick University*, Coventry, UK
- Analytical and numerical calculations of the electro-physiological behavior of the cardiac muscle
- Asymptotic methods with Maple and development of a spectral code in C

1994 – 1998 **Researcher and Teacher**, *LEMTA*, Nancy
- Research on the dynamics of curved vortex filaments using Fortran, Matlab, and Maple
- Teaching *Fluid Mechanics* and *Mathematics* at ENSEM Nancy

1993 – 1994 **Test Design Engineer**, *Nuclear Studies Center (CENG)*, Grenoble
- Modification of a thermal treatment furnace for irradiated uranium pellets

Education

Sep. 1997 **PhD in Fluid Mechanics**, *INPL*, Nancy, France
PhD on the dynamics of slender vortex filaments.

Sep. 1993 **Engineering Degree and Master in Mechanical Engineering**, *ENSEM-INPL*, Nancy, France
Specialization: Fluid Mechanics and Heat Transfer.

Qualifications

Feb. 2002 **Qualification from the National Council of Universities (CNU)**
- In section 26: Applied Mathematics and Mathematical Applications
- In section 60: Mechanics, Mechanical Engineering, Civil Engineering

Additional Training

2024 **MBSE and Enterprise Architecture**, *Systems Modeling Trainings*

2018 **Probability Theory**, *Introduction to Probability, Parts 1 and 2*, Coursera MOOC

Languages

English Professional (1.5-year stay in the United Kingdom in 1999)

French Native language

Interests

Hobbies Participation in a collaborative scientific research activity (one article in 2024)

Cultural Listening to podcasts (mathematics, computer science, education) and reading in mathematics

Volunteering Involvement in the *Les Maths En Scène* association (puzzles, website management, etc.)

Selected Publications

M. Rodal, **D. Margerit**, R. Klein, *Slender vortex filaments in the Boussinesq approximation*, Physics of Fluids 36(5), May 2024, doi

D. Margerit, P. Brancher, A. Giovannini, *Implementation and validation of a slender vortex filament code*, Int. J. for Numerical Methods in Fluids, Volume 44, Issue 2, p. 175-196, 2003, doi

D. Margerit, D. Barkley, *Selection of twisted scroll waves in three-dimensional excitable media*, Phys. Rev. Lett. 86, 175-178, 2001, doi

D. Margerit, J-P. Brancher, *Asymptotic Expansions of the Biot-Savart law for a slender vortex with core variation*, Journal of Engineering Mathematics, 40 (3), p. 297-313, 2001, doi