

Thomas Laporte

Engineer in applied mathematics and modeling (numerical engineering)
Ph.D. student in applied mathematics



Informations

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Website | <https://laportethomas.github.io/>

Skills

Computer languages

Python, Julia, C++, HTML, CSS, Scilab,
Matlab

Simulation, CAD and Visualisation software

Abaqus, Solidworks, Rhino 3D, Paraview,
Meshlab, GMSH

Other software

Latex, Indesign, Photoshop, Illustrator, Office

Languages

English (TOIEC : 855), Spanish

Hobbies

Sports

Football (14 years of competition)
Running (5 years of competition)
Skiing (20 years of competition)

Other

Travel (Canada, Turkey, Egypt, New Zealand,
Croatia)
Series | Films | Reading

Others

Entrepreneurship (Sept 2017 - Dec 2018)

Graphic charter and design for a mobile
application (InMyFridge).

Volunteering (2010-2020)

Volunteer during running and triathlon
competitions.

Respo Ski at BDE Polytech Nice (2016)

Organisation of a ski week for the students of
the school.

Experiences

Ph.D. - Applied Mathematics (Since September 2019)

Laboratory J.A. Dieudonné and Inria Sophia - Antipolis - Nice, France

3D modelling of the respiratory system from medical images and numerical simulation of the effects of breath-hold diving.

Ph.D. supervised by Benjamin Mauroy (CNRS) and Angelos Mantzafaris (Inria). Creation of a tool to generate a 3D representation (mesh) of the couple Lung / Bronchial tree from medical images (CT-Scan). These meshes are then used for numerical simulations based on finite elements to simulate competitive freediving.

The project is divided into 4 main stages:

- Segmentation, via Deep Learning algorithms, of the lung lobes and the first generations of the bronchial tree from CT scans. (Python using Pytorch Library)
- Creation of surface meshes associated with the different segmentations via the «Marching Cubes» method. (Python)
- Generation of the bronchial tree and its associated mesh. The algorithm developed is based on volume filling with morphometric and physiological constraints. (Julia Language)
- Creation of a lung compression model to simulate competitive freediving. The model was then implemented, via the finite element method, to generate numerical simulations. (C++ with deal.ii)

Ph.D. relay (Sept 2018 - Sept 2019)

Laboratory J.A. Dieudonné and Inria Sophia-Antipolis - Nice, France

Segmentation and extraction of lungs and bronchial tree from medical images (CT-Scan). Mesh fitting using B-Splines.

5th year project and internship (Sept 2017 - Sept 2018)

Laboratory J.A. Dieudonné - Nice, France

Auckland Bioengineering Institute - Auckland, New-Zealand

Mechanical study of the respiratory system (lungs and bronchial tree). At the LJAD, the modelling was carried out on Rhino 3D and the simulation on Abaqus. At the ABI, the work was carried out on subjects by creating a specific 3D model, based on medical images, and a mechanical study of each case.

4th year internship (June 2017 - August 2017)

Inria Sophia-Antipolis - Nice, France

Modeling of the movements of the fingers of the hand. Project done in C++ with a visualization via Axel (Inria software).

Education

Engineering degree - Applied Mathematics and Modeling, Numerical Engineering option (2015 - 2018)

Polytech Nice Sophia - Nice, France

Engineering tools in applied mathematics and modelling, such as computer-aided design, optimisation methods or numerical analysis, solid and fluid mechanics from a theoretical point of view but also the use of software such as Matlab, Abaqus, Rhino 3D for the practical side.

Polytech preparing cycle (2013 - 2015)

Polytech Nice Sophia - Nice, France

Baccalauréat S - Graduated with honours (2013)

Lycée Albert Calmette - Nice, France