

Nicolas Douillet

PhD - Engineer  
Geometry, 3D reconstruction  
Image processing



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#### PRO & IT SKILLS

Image & signal processing

3D reconstruction

Optimization

Matlab

Python

Simulation & modeling

Data analysis

Inverse problem

Photogrammetry

C++ & algorithms

Prototyping

Meshlab

Mic Mac

Maple

Latex

#### WORK EXPERIENCE

2019 - 2020

**Mathworks** : algebraic geometry. [Mesh processing toolbox](#). > 60 contributions with documentation, and 2.5k downloads.  
**Hi !** (start-up, smartphone application) : extern consulting for technological project management and methodology.

2018 - 2019

**Youdome** (Monaco) : R&D engineer responsible for the software development. Bodyscan and [measures on 3D avatars](#).

02 - 06 2018

**Nice regional education authority** : math teacher. A level, science section. Lycée Carnot, Cannes.

2017

**Mathworks** : functions and algorithms developments for the Mathworks file exchange community.  
**Sculpteo** : design, programming and mesh of 3D printable mathematical surfaces : [3D printing project](#).

2013 - 2016

**INRIA** (Sophia Antipolis) : R&D engineer

**Galaad** (2013 - 2014) : [surface fitting with NURBS](#). NURBS parameterization. C++, Eigen lib Developed surface fitting and curve fitting plugins. Terrific european project. Collaboration : Missler software / Topsolid.

**Titane** (2014 - 2016) : [surface reconstruction with mesh](#). Optimization and integration of a high precision meshing technique (scale space meshing). C++, CGAL & Qt libs. C3DC (Culture 3D Cloud) project. Collaborations : CNRS Map, IGN, Telecom Sud Paris.

2012 - 2013

**Cours Nicholas** : Micro enterprise : private tutoring in mathematics and physics.

2012

**THALES** (Sophia Antipolis) : software engineer. classified project for DCNS. C language.

2008 - 2010

**ESAIP** (Grasse) : physics teacher in optics and electronics. 1<sup>st</sup> year engineer: ~ 90h.

08 - 09 2006

**INSA Lyon** : math teacher, ASINSA dept summer school (chinese and vietnamese students): ~ 40h.

02 - 08 2006

**CREATIS INSA** (Lyon) : Msc project. [Echocardiographic images and videos segmentation](#). Level sets, snake curves. Matlab. Collaboration : CHU Bordeaux.

06 - 09 2005

**CREATIS INSA** (Lyon). Engineering internship. [Dynamic imaging and tracking markers on videos](#), for the study of tyre physics. Matlab. Collaboration : Michelin.

## EDUCATION

2007-2011

**ARTEMIS-OCA** (CNRS, Nice) : **PhD** Modeling and algorithms for space interferometer LISA (ESA-NASA project). Data analysis, inverse problem, parameter estimation, non convex optimization, time-frequency plan. Award : price of the best PhD poster in 2010 & 2011. Matlab, C++.

2006-2007

**UCBL** (Lyon) : fundamental mathematics. Project on parameterized surface curvature.

2005-2006

**INSA Lyon : Msc.** Image processing, passed with distinction. Movement detection, tomography, inverse problem.

2003-2006

**ESCPE Lyon : engineer**

Main subjects : image and signal processing, computer science and algorithms, probabilities.

Projects : optimization techniques (3D reconstruction), shapes intersection detection using Freeman coding, discrete probabilities (random model of a sand heap).

2000-2003

**College prep in superior mathematics (Math-Sup/Spe).** Two years full-time higher education in science, languages and general studies, in preparation for competitive entry to Grande Ecoles (high-level schools of science).

## OPERATIONAL SKILLS

- Design and implementation of mathematical and technical algorithms.
- Modeling, digital computation
- Research, prototyping
- Object digitization (photogrammetry, point clouds generation, mesh reconstruction)
- Object design / 3D printable ready mathematical surfaces
- Scientific diffusion

## LANGUAGES

French

Native speaker.

English

Fluent. FCE (First Certificate of Cambridge University ), B level. Working language.

German

Working knowledge

## INTERESTS & PERSONAL RESEARCH PROJECTS

- 3D mesh reconstruction from 3D convex hull « Divide and conquer » algorithm.
- Meshed fractal geometry : my fractal gallery (Sierpinski ball : world first).
- Geometric arithmetics (prime number set visualization, conjecture on twin primes).
- Autostereograms generation.

## EXTRA CURRICULAR ACTIVITIES & INTERESTS

Teaching

Personal mathematics and physics teacher for high school and post baccalaureate pupils in science courses. Eight years experience with results and recommendations (2004-2013).

Scientific diffusion

SACA (Société Astrophysique de Cannes). Conferences on gravitational wave detection (2009-2010) .gif creation for Wikimedia (convex hull algorithms). INRIA MASTIC.

Sports & Leisure

Reading, rock climbing (20y), slacklining(6y), game of Go (10y).  
Other information : knowledges in aeronautics (PPL license holder). Mensa society member.