

# Gilles Daviet

French nationality

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## Profile

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At the conjunction of computer science, applied mathematics, and physics, my interests lie in combining algorithmic and mathematical optimization to recreate natural phenomena in virtual environments with high fidelity.

## Employment

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- 2021 – Present    **Senior Software Engineer** at *NVIDIA*  
Physics-based simulations & Deep Learning
- 2016 – 2021    **(Senior) Simulation Researcher** at *Weta Digital* (Wellington, New Zealand)  
Helped architect a distributed physics backend for unifying the simulation of materials such as cloth, hair, muscles, and rigid bodies, reducing the number of passes required by visual effects artists to deliver their final results. Designed novel algorithms for the scalable treatment of collisions, solid-fluid interactions, and inverse dynamics. Led the development of new-generation hair simulation systems. Helped transition tools to production with close artist support.
- 2011 – 2012    **Researcher** at *Weta Digital* (Wellington, New Zealand)  
Built tools for the numerical simulation and grooming of hair and fur in feature films.
- 2009 – 2011    **Research engineer** at *Inria* (Grenoble, France)  
Designed novel algorithms for the numerical simulation of hair dynamics with friction.

## Education

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- 2013 – 2016    **PhD in Computer Science and Applied Mathematics** at *Inria* and *Université Grenoble Alpes* (Grenoble, France), advised by Florence Bertails-Descoubes  
Numerical simulation of granular materials as continua, with applications to Computer Graphics.
- 2006 – 2009    **Master** in Computer Science and Applied Mathematics at *Grenoble INP - ENSIMAG* (Grenoble, France). With honors.

## Awards and Credits

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- Academy Award for Technical Achievement** for the *Synapse Hair Simulation System*  
N. Ryan, C. Sprenger and G. Daviet, 2021 Sci-Tech Oscars
- Best dissertation award** from the French Computer Graphics and Virtual Reality research group (GdR IGRV, 2017)
- Selected movie credits:** *The Hobbit: An Unexpected Journey* (2012), *War for the Planet of the Apes* (2017), *Alita: Battle Angel* (2019)

## Skills

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- Programming**    C++ (*OpenMP*, *Eigen*, *Intel MKL*), Python
- Graphics**        Autodesk Maya, SideFX Houdini, OpenGL
- Languages**      French (Native), English (Fluent)

## Selected Publications

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- Simple and Scalable Frictional Contacts for Thin Nodal Objects** (2020)  
G. Daviet, *ACM SIGGRAPH 2020*
- A Semi-Implicit Material Point Method for the Continuum Simulation of Granular Materials** (2016)  
G. Daviet and F. Bertails-Descoubes, *ACM SIGGRAPH 2016*
- A hybrid iterative solver for robustly capturing Coulomb friction in hair dynamics** (2011)  
G. Daviet, F. Bertails-Descoubes and L. Boissieux, *ACM SIGGRAPH Asia 2011*

## Additional information

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**Personal interests:** Ski touring, trail running, mountaineering. Photography.

**References:** available upon request.