Damien Rohmer, PhD

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Citizenship: French
30 years old, single.

Research

I am researcher in **Computer Graphics** with the **IMAGINE** team from **INRIA** Grenoble, and at the engineering school **CPE Lyon**, France.

My research topics concerns the modeling, deformation and animation of 3D models with a high level control. My previous works includes the deformation of skinnied character deformation at constant volume or using implicit surfaces, the animation of wrinkles in cloth simulation, and the modeling of developable surfaces.
I am also collaborating with other pluri-disciplinary areas. One is a collaboration for a new mathematical surface visualization such as the *flat torus* as member of the *HEVEA* team with Institut Camille Jordan in Lyon and GIPSA Lab from Grenoble. An other collaboration is about medical image visualization of heart DTMRI with LBNL, Berkeley.

Research indicators

- 5 international journal/conference papers (2 ACM SIGGRAPH)
- 1 book chapter
- 21 publications in total (including workshops, technical reports and dissemination)
- Citation indicators in 2013 (*s*rc: Publish or Perish):
  - H-index: 5 ; G-index: 11
  - 3 papers the most cited: [RSG07]: 60 ; [RPCH10]: 24 ; [RHC09]: 18
  - 140 citations in total.
- 3 Master students supervised or co-supervised.
- 2 PhD students co-supervised.

Education

2007-2011

PhD in Computer Graphics .
Université de Grenoble, Grenoble Institute of Technology (INPG), France.
Active Geometry for Animation and Modeling.
Supervisors: Stefanie Hahmann and Marie-Paule Cani (Grenoble INP).
Laboratory: LJK (Laboratoire Jean Kuntzmann) and INRIA Grenoble, France.

2006-2007

Master of Science in Computer Science.
Université Jean-Monnet, Saint-Etienne, France.
OIV (Optics, Image, Vision). Major in computer graphics and image processing.
`Graduated with highest honors.`

2003-2007

Engineering degree in Computer Science and Electrical Engineering.
CPE Lyon, France.
ETI (Electronic, Telecommunication, Informatics). Major in image processing.
`Graduated with highest honors.`

2005-2006

Graduated class at UCB .
University of California Berkeley, USA
Math 228A (Fall 2005), Numerical solution of ODE (prof. John Strain).
Math 228B (Spring 2006), Numerical solution of PDE (prof. John Strain).
Bioengineering 290F (Fall 2005), Principle of MRI (prof. Steve Conolly).

2001-2003

Preparatory school.
Institution des Chartreux, Lyon, France.
Math sup, Math spé.

2000-2001

Bachelor of Science
Lycée Mangin, Sarrebourg, France
Major in physics
`Graduated with high honors.`

Work Experience

2010-today

Associate professor.
CPE Lyon, France.

Teaching: Computer Science, Computer Graphics, Image and Signal processing.
Research: IMAGINE team, INRIA Grenoble, France

2007-2010

Teaching assistant.
Polytech Grenoble, France.

Lecturer and Lab class instructor in Computer Science in engineering school and University (Polytech Grenoble, UFR IMAG, ENSIMAG).

2007 *(6 months)*

Research master internship.
LJK-INRIA Lab, Grenoble, France.

Constant volume deformation of skinned characters.
Supervisors: Marie-Paule Cani and Stefanie Hahmann (INPG).

2006-2007

Research assistant
Lawrence Berkeley National Laboratory (LBNL), Berkeley USA.

Research work in medical imaging.
Tomography and heart modeling using SPECT and DTMRI modalities.

2004 *(2 months)*

Stock manager
ABB Entrelec, Lyon, France.

2003 *(3 months)*

Waiter
Lake Vyrnwy Hotel, Lanwdyyn, Wales.

Publications

Peer-reviewed international publications and conferences

[VBG+ SIG13] Rodolphe Vaillant, Loic Barthe, Gael Guennebaud, Marie-Paule Cani, Damien Rohmer, Brian Wyvill, Olivier Gourmel, Mathias Paulin. Implicit Skinning: Real-Time Skin Deformation with Contact Modeling. *ACM Transactions on Graphics (TOG) 32(4).* Proceedings of ACM **SIGGRAPH** (2013).

[RPC+ SIGA10] Damien Rohmer, Tiberiu Popa, Marie-Paule Cani, Stefanie Hahmann, Alla Sheffer. Animation Wrinkling: Augmenting Coarse Cloth Simulations with Realistic-Looking Wrinkles. *ACM Transactions on Graphics (TOG), 29(6). Proceedings of ACM* **SIGGRAPH ASIA** (2010).

[RHC SCA09] Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Exact Volume Preserving Skinning with Shape Control. *ACM SIGGRAPH/Eurographics* **Symposium on Computer Animation** *(SCA)*, p83-92 (2009).

[RHC PG08] Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Local Volume Preservation for Skinned Charaters. *Computer Graphics Forum, 27(7), p1919-1927. Proceedings of* **Pacific Graphics** *(PG)* (2008).

[RSG IR07] Damien Rohmer, Arkadiusz Sitek, Grant T. Gullberg. Reconstruction and Visualization of Fiber and Laminar Structure in the Normal Human Heart from Ex Vivo DTMRI Data. **Investigative Radiology**, 42(11) (2007).

Book chapter

[GRVG CM12] Archontis Giannakidis, Damien Rohmer, Alexander Veress, Grant T. Gullberg. Diffusion Tensor Magnetic Imagine-Derived Myocardial Fiber Disarray in Hypertensive Left Ventricular Hypertrophy. *Cardiac Mapping, 4th Edition* p.574-588, **Wiley** (2012).

Thesis

[PhD Thesis11] Damien Rohmer. Géométrie active pour l'animation et la modélisation. PhD Thesis. **Université de Grenoble** (2011).

	Committee members :	
Bruno Lévy	INRIA Nancy	Reviewer
Eric Galin	Lyon University	Reviewer
Loic Barthe	Toulouse University	Committee member
Valérie Perrier	Grenoble University	Committee president
Stefanie Hahmann	Grenoble University	Supervisor
Marie-Paule Cani	Grenoble University	Supervisor

[Ms Thesis08] Damien Rohmer. Déformation interactive par skinning à volume constant. Master Thesis. CPE Lyon, INRIA Grenoble, LJK Laboratory. 2008.
`Best thesis award from` *`Les amis de l'Université de Lyon`*`.`

Workshops, short papers & posters

[RCHT EG11] Nicole Cogo, Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Duplication de détails pour la déformation de surfaces. *Groupe de Travail en Modélisation Géométrique (***GTMG***)* (2013)

[RCHT EG11] Rodolphe Vaillant, Loic Barthe, Gael Guennebaud, Marie-Paule Cani, Damien Rohmer, Brian Wyvill. Déformation de la peau d'un personnage avec prise en compte des contacts. *Revue Electronique Francophone d'Informatique Graphique (***REFIG***)*, journées de l'AFIG (2011)
`Best paper award`

[RCHT EG11] Damien Rohmer, Marie-Paule Cani, Stefanie Hahmann, Boris Thibert. Folded Paper Geometry from 2D Pattern and 3D Contour. **Eurographics** *(Short Paper)* (2011).

[RHC MIG10] Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Active Geometry for Game Characters. *Springer, Lecture Notes in Computer Science (***LNCS***). Proceedings of* **Motion in Games** *(MIG)* (Invited Paper) (2010).

[RCH GTAS10] Damien Rohmer, Marie-Paule Cani, Stefanie Hahmann. Animation rapide de personnages et animaux: Skinning à volume constant et ajout de plis pour la simulation de vêtements. *Groupe de Travail en Animation et Simulation (***GTAS***)* (2010).

[RCHT GTMG10] Damien Rohmer, Marie-Paule Cani, Stefanie Hahmann, Boris Thibert. Génération de surfaces isométriques à un patron par découpage récursif. *Groupe de Travail en Modélisation Géométrique (***GTMG***)* (2010).

[RHC LJK09] Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Constant Volume Skinning for Character Animation. *Journée de rentrée du LJK* (poster) (2009).

[RHC GTMG08] Damien Rohmer, Stefanie Hahmann, Marie-Paule Cani. Déformation interactive par skinning à volume constant. *Groupe de Travail en Modélisation Géométrique (***GTMG***)* (2008).

[REG SNM06] Damien Rohmer, Robert L. Eisner, Grant T. Gullberg. The Effect of Truncation on very Small Cardiac SPECT Camera Systems. *53rd Annual Meeting of the* **Society of Nuclear Medicine** *(SNM)* (2006).

[SKR+ LBNL06] Arkadiusz Sitek, Gregory Klein, Damien Rohmer, Ronald Huesman, Grant T. Gullberg. Application of a biomechanical model of the left ventricle for estimation of cardiac function in gated human PET studies. *53rd Annual Meeting of the* **Society of Nuclear Medicine** *(SNM)* (poster) (2006).

Technical reports

[RSG LBNL06] Damien Rohmer, Arkadiusz Sitek, Grant T. Gullberg. Reconstruction and Visualization of Fiber and Sheet Structure with Regularized Tensor Diffusion MRI in the Human Heart. **Lawrence Berkeley National Lab** technical report, LBNL-60277 (2006).

[RSG LBNL06*] Damien Rohmer, Arkadiusz Sitek, Grant T. Gullberg. Visualization of Fiber Structure in the Left and Right Ventricle of a Human Heart. **Lawrence Berkeley National Lab** technical report, LBNL-61064 (2006).

[RSG LBNL06]** Damien Rohmer, Arkadiusz Sitek, Grant T. Gullberg. Simulation of the Beating Heart Based on Physically Modeling a Deformable balloon. **Lawrence Berkeley National Lab** technical report, LBNL-60664 (2006).

[RG LBNL06] Damien Rohmer, Grant T. Gullberg. A Bloch-Torrey Equation for Diffusion in a Deforming Media. **Lawrence Berkeley National Lab** technical report, LBNL-61295 (2006).

[REG SNM06*] Damien Rohmer, Robert L. Eisner, Grant T. Gullberg. The Effect of Truncation on very Small Cardiac SPECT Camera Systems. **Lawrence Berkeley National Lab** technical report, LBNL-60680 (2006).

Communications and related works

Flat Torus visualization

As member of the *HEVEA* team in collaboration with Boris Thibert, Francis Lazarus, Saïd Jabrane and Vincent Borrelli from Laboratoire Jean Kuntzmann (Grenoble), GIPSA Lab (Grenoble), and Institut Camille Jordan (Lyon), I am in charge of the visualization and rendering of the *Flat Torus* surface. The resulting visualization have been presented in numerous publications including

- Cover page of the proceedings of the **National Academy of Sciences (PNAS**). Flat torus in 3D, vol. 109, n.19, April (2012).
- Les fractales lisses, un nouvel objet mathématique. **Pour la Science**, n.425, March (2013).
- Le tore plat carr visualisé grâce à l'informatique; 5ème plus belle découverte de l'année. **La Recherche**, n.471, January (2013).
- Le tore plat n'a plus de secrets. **Science et Vie**, n. 1138, July (2012).
- Rothorn, un tore plat! **Images des Maths**, December (2012).
- Gnash, un tore plat! **Images des Maths**, December (2012).
- Plat comme un tore. **Magazine Science**, November (2012).
- Une beauté fractale en 3D. **CNRS, Le Journal**, n.267 July (2012).
- Exposition at the **Cité des Sciences** (Paris), July (2012).

Cloth wrinkles animation

Several publications of diffusion are related to the SIGGRAPH Asia 2010 publication [**RPC+ SIGA10**].

- Back cover image on the proceedings on Transaction on Graphics, 29(6) (2010).
- Appear in SIGGRAPH Asia 2010, Technical Papers Preview Trailer (2:07-2:17).

- Les jeux vidéo prennent le bon pli, **CNRS, Le Journal**, n. 256, p. 10, May (2010).
- Ajout de plis pour lanimation de vêtements dans le jeu vidéo, Institut National des Sciences Mathématiques et de leurs Interactions (**INSMI**).
- Radio anouncement at **France Inter, La Tête au Carré** (2010).
- Important anual discovers from Laboratoire Jean Kuntzmann (2010).

Constant volume skinning

The constant volume skinning published in [**RHC PG08**] has been implemented within a virtual environment framework called *Hand Navigator*. The following publications where using this deformation approach.

- Jean-Rémy Chardonnet, André De Carvalho Amaro, Jean-Claude Léon, Marie-Paule Cani. Hand Navigator : Prototypages de peripheriques d'interaction pour le controle d'une main virtuelle. *Journees de l'Association Franaise de Realite Virtuelle (AFRV)* (2009).
- Jean-Rémy Chardonnet, André De Carvalho Amaro, Jean-Claude Léon, Marie-Paule Cani. Hand Navigator : Experimenting hand navigation in desktop virtual reality. *EGVE/ICAT/EuroVR, Virtual Reality Conference* (2009).
- Jean-Rémy Chardonnet, Jean-Claude Léon. Design of an immersive peripheral for object grasping. *ASME 2010 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC)*, p. 1-10 (2010).
- Jean-Rémy Chardonnet, André De Carvalho Amaro, Jean-Claude Léon, Damien Huyghe, Marie-Paule Cani. Designing and evolving hands-on interaction prototypes for virtual reality. *Virtual Reality International Conference (VRIC)*, p.25-34 (2010).

Renderings for other publications

I have computed some rendering using high quality off-line renderer for collegues and the pictures have been used as illustration in the following publications

- Adrien Bernhard, Loic Barthe, Marie-Paule Cani, Bryan Wyvill. Implicit Blending Revisited. *Computer Graphics Forum, 29(2), p.367-375, Proceedings of Eurographics* (2010).
- Grant Gullberg. Talk at *World Molecular Imaging Conference (WMIC)* (2009).

Other communication publications

[R VC09] Damien Rohmer. Les mathématiques pour expliquer la forme des cristaux. *Vision Croisées*, n.4, p2 - Journal Universitaire de Grenoble (2009).

Teaching work

I teach 200h a year in a French Engineering school CPE Lyon. Since 2007, I am totaling more than 700h of teaching experience and taught in more than 5 University (CPE Lyon, Polytech Grenoble, UFR-IMAG, ENSIMAG, International Master IMESI).
I am in charge of the Computer Graphics domain at CPE Lyon since 2010, and responsible for the coordination of the Math/Signal/Image area since 2013. I teach both specialized (equivalent to Master) and basic classes (equivalent to undergraduated class of French Licence). I teach Computer Graphics at Master level, and various topics at undergraduate levels including basics of Computer Science and Software Development, Image and Signal Processing, and general Applied Mathematics. The number of students per class varies from 20 at Master level to 130 for undergraduated classes.
I usually do the practical programming classes with collegues, the more often with Jean-Marie Becker or David Odin.

Enumeration of taught classes

The labels are the following:

Domain

- CG: **C**omputer **G**raphics
- CS: Computer Science
- IP: Image Processing
- SP: Signal Processing

Class type

- L: Lecture
- LC: Lab class
- T: Tutoring

Level

- 5ETI: Master 2 level (15 students)
- 4ETI: Master 1 level (20-40 students)
- 3ETI: Licence level (130 students)

2012-2013, CPE Lyon

Domain	Class topic	Language	Hours	Class type	Level
CG	**OpenGL & Mesh Processing**	C++	40h	L/LC	5ETI
CS	**System programming**	C	40h	LC	4ETI
CS	**Software Development**	C	36h	L/LC	3ETI
CG	**Rendering**	C++	28h	L/LC	4ETI
CS	**System programming**	C	24h	LC	3ETI
IP	**Image & video compression**	C++	20h	L/LC	5ETI/5IRC
SP	**Linear signal analysis**	Matlab	16h	LC	3ETI
CG	**Research project**	C++	10h	T	5ETI
IP	**Active contours**	C++	8h	T	4ETI

2011-2012, CPE Lyon

Domain	Class topic	Language	Hours	Class type	Level
CS	**System programming**	C	40h	LC	4ETI
CG	**OpenGL & Mesh Processing**	C++	30h	L/LC	5ETI
CG	**Rendering**	C++	28h	L/LC	4ETI
CS	**Oriented object programming**	C++	18h	LC	3ETI
SP	**Linear signal analysis**	Matlab	15h	LC	3ETI
SP	**Stochastic signal analysis**	Matlab	8h	LC	4ETI
CG	**Introduction to computer graphics**		2h	L	3ETI
CG	**Research project**	C++	10h	T	5ETI
IP	**Active contours**	C++	8h	T	4ETI
CS	**Programming project**			T	3ETI

2010-2011, CPE Lyon

Domain	Class topic	Language	Hours	Class type	Level
CS	**System programming**	C	40h	LC	4ETI
CG	**OpenGL & Mesh Processing**	C++	26h	L/LC	5ETI
CG	**Rendering**	C++	28h	L/LC	4ETI
SP	**Linear signal analysis**	Matlab	24h	LC	3ETI
SP	**Stochastic signal analysis**	Matlab	8h	LC	4ETI
CG	**Research project**	C++	10h	T	5ETI
IP	**Active contours**	C++	8h	T	4ETI
CG	**Introduction to computer graphics**		2h	L	3ETI
CS	**Programming project**			T	3ETI

I was teaching assistant for Polytech Grenoble during my PhD.

2007-2010, Polytech Grenoble (/UFR IMAG, ENSIMAG)

Dom.	Class topic	Lang.	H.	Type	Level
CG	**Multiresolution & Visualization**	C++	60h	L/LC	Polytech (RICM3)
CS	**Algorithm and data structure**	ADA	54h	LC	ENSIMAG (1st year)
CS	**HIM**	Java	24h	LC	Polytech (RICM2)
IP	**Image analysis**	Matlab	15h	LC	M1 Info, UFR IMAG
CS	**Networks**	Bash	12h	LC	M1 MIAGES, UFR IMAG
CG	**Mesh Processing**	C++	10h	L/LC	5ETI, CPE Lyon
CG	**Volumic visualization**	C++	11h	L/LC	M1 info/M2 CAO, UFR IMAG

During my undergraduate studies I also gave class as a volonteer.

2004-2005.	Tutoring for undergrad students (Math sup) in Mathematics and Physics.	Institution des Chartreux, Lyon.
2002-2005.	Volonteer tutoring for high school students in Mathematics and Physics.	SPES soutien scolaire, Lyon.

Special Classes

I gave class for the **Journées prof de prépa** on specialized topics to teachers from French preparatory school. Teachers from prepas are coming from several parts of France and a full class is about 15 persons. The classes are usually a mix of lecture and programming practice.

- 2013: Python programming for preparatory school (1.5 day).
- 2012: Introduction to ray-tracing in computer graphics (0.5 day).

I also gave class for an **international Master IMESI** in collaboration with *INSA Lyon*. The class was given in english to 4 international M1 students. The class was both class and practical programming for a total of 10h about Numerical Methods (Numerical Integration and Ordinary Differential Equation).

Involvement in school life

- Participation to *Journées portes ouvertes de CPE*, since 2007 (6x one day)
- Participation to various forums:
  - L'étudiant Lyon, 1 day (2013)
  - Le Monde Paris, 2 days (2012)
- Tutoring:
  - Apprentices (IRC section): 3 students per year.
  - Master student: about 4-5 per year.
  - Master jury: about 10 per year.
  - Freshmen selection jury (IRC): 1 day per year.

Main personal contributions in teaching

Automated scripting tests for large number of student works.

- Fast automated feedback for students (pass/failed for several criterias).
- Automated accurate and neutral grading based on the results for 130 students.
- Automated detection of cheating such as plagiat.

I developed and setup the automatic scripting tests in the computer sciences classes (System Programming and Software Development). The scripts are written in both Python language and Bash. The entire system is more than 5000 lines of code.

New approach for teaching computer sciences as software development.

- Class focused on methodologies paradigms (contracts, testing, design) to develop large programm in a collaborative manner.
- Avoiding previous technical details taught in previous classes (dynamic memory management, pointers arithmetic) which can be automatically handled by new languages.
- New class and new large project (400 slides, 50 pages of project instructions and about 3000 lines of skeleton code).

The class is taught in C. It does not focuss on specific details of C programming language, but on general methodologies instead. I developed a project on chessgame coding, and the class was taught to almost beginners after only 35h of introduction to C.

Consistent framework for Computer Graphics practice

- Providing to students various basic class to help computer graphics programming (vector, matrix, meshes, etc) that are re-used through the different classes, practices, or even later in a future job.
- Provide OpenGL setups which varies for different lab class but enable to focuss students on computer graphics algorithms.
- Provide preexisting GUI to enable student to get nice visual results even for a 4h practice class (volume rendering, cloth simulation, skinning animation, etc).

The differents structures are written in C++, the basics classes are shared for more than 10 practical classes, and the code is more than 15000 lines in total.

Ray-tracing teaching software development.

- Visualization of a 3D scene in real-time with flight through camera.

- Customized emulation of a ray-tracing algorithm from a defined point of the 3D scene.
- Visualization of the ray-tracing camera system and resulting image, lights and geometric objets.
- Navigation and visualization in the various rays shotted for the ray-tracing algorithm. Visualization of reflected rays, and shadowing effects.

This teaching purpose tool is written in C++, and is about 5000 lines of code. It greatly ease the comprehension of the ray-tracing algorithm thanks to its interactivity and 3D nature compared to static slides or blackboard drawings.

Research supervision

PhD student

- **Ulysse VIMONT**. Natural scene control. With Marie-Paule Cani. [2013-2016]
- **Camille SCHRECK**. Modeling and deforming active shapes. With Stefanie Hahmann. [2013-2016]

Master student (6 months)

- Camille SCHRECK. Animation and manipulation of creased paper. With Stefanie Hahmann and Marie-Paule Cani. [2012]
- Nicole COGO. Detail preserving deformations. With Stefanie Hahmann and Marie-Paule Cani. [2011]
- Amaury JUNG. Sketch-based design of developable surfaces. With Stefanie Hahmann and Marie-Paule Cani. [2011]

M1 student

- Camille SCHRECK. [2011]
- Ulysse VIMONT. [2011]

Responsabilities & Community involvement

Office responsabilities

- Responsible of the coordination for the *math, signal and image* department at CPE Lyon.
- In charge of the the computer graphics area at CPE Lyon.

Miscellaneaous responsabilities

- In charge of the website of the IMAGINE team (https://team.inria.fr/imagine/).
- In charge of the redaction of the INRIA annual report for IMAGINE (Raweb) [2011,2012] : information gathering, illustrations and report structure.

Involvement in scientific diffusion

- Participation to *fête de la science* about the flat torus in Paris and Lyon. Creation of 12 posters [2013].
- Member of the journal commitee *Vision Croisées*, a Universitary dissemination magazine gathering various scientific subjects [2008,2009].

Reviewing

- ACM SIGGRAPH [2012,2013].
- ACM SIGGRAPH Asia [2011,2012,2013].
- Eurographics [2008,2010,2011,2012].
- ACM Transaction on Graphics (TOG) [2011].
- IEEE Transaction on Visualization and Computer Graphics (TVCG) [2011].
- IEEE Computer Graphics and Applications (CG&A) [2010,2011,2013].
- Symposium on Geometry Processing (SGP) [2012]
- Symposium on Computer Animation (SCA) [2009].
- Association Francaise d'Informatique Graphique (AFIG) [2012].

Committee member

- Technical briefs and posters commitee member for ACM SIGGRAPH Asia 2013.
- Local organization commitee for the GTMG 2011 (Grenoble).
- Member of the Best Paper commitee for AFIG-EGFR [2012,2013].

Community membership (since 2010)

- Association of Computing Machinery (ACM).
- Eurographics (EG).
- Association Francaise d'Informatique Graphique (AFIG).

Older responsabilities

- Responsible of the EVASION team working group [2009 - 6 months]
- Organization of the PhD's students working group in EVASION team [2010 - 6 months].
- Delegate member of *Conseil du Laboratoire* at LJK as PhD's student delegate (elected member) [2009-2010].