



# Olivia Miraucourt, 28

## PhD in Applied Mathematics (4th year, ATER)

Title **Generation of complex vascular models for blood flow simulation**

Unity Mathematics Laboratory of Reims (LMR) EA 4535

Directors Stéphanie Salmon, LMR (Reims)

Hugues Talbot, Laboratoire d'Informatique Gaspard-Monge (ESIEE Paris-Est)

Resume The aim of my thesis is to design 4D vascular models for the creation of virtual cerebral angiography images. From segmented medical images, it is first necessary to perform geometry and topology corrections. Then we generate 2D and 3D meshes in order to finally simulate blood flows in realistic geometries.

Publications - Olivia Miraucourt, Olivier Génévaux, Marcela Szopos, Marc Thiriet, Hugues Talbot, Stéphanie Salmon and Nicolas Passat,

**3D CFD in complex vascular systems: A case study,**

*6th International Symposium on Biomedical Simulation*, pp. 86-94, 2014.

- Ania Jezierska, Olivia Miraucourt, Hugues Talbot, Stéphanie Salmon and Nicolas Passat,  
**A non-local Chan-Vese model for sparse, tubular object segmentation,**  
*21st International Conference on Image Processing*, pp. 907-911, 2014.

- Olivia Miraucourt, Stéphanie Salmon, Marcela Szopos and Marc Thiriet,  
**Blood flow simulations in the cerebral venous network,**  
*3rd International Conference on Computational and Mathematical Biomedical Engineering*, pp. 187-190, 2013.

Posters - Olivia Miraucourt, Stéphanie Salmon and Marcela Szopos,

**Simulation d'écoulements sanguins dans le réseau veineux cérébral,**

*30th Conference on SMAI*, Seignosse, May 2013.

- Olivia Miraucourt, Stéphanie Salmon, Hugues Talbot and Nicolas Passat,  
**Génération de modèles vasculaires complexes pour la simulation d'écoulements sanguins,**  
*Journée des Jeunes Chercheurs de la SFR CAP-Santé*, Amiens, March 2014.

- Olivia Miraucourt, Stéphanie Salmon, Hugues Talbot and Nicolas Passat,  
**Méthodes variationnelles pour la segmentation d'images médicales,**  
*Journée des Jeunes Chercheurs de la SFR CAP-Santé*, Reims, March 2015.

Teaching Enhanced doctoral contract, Faculty of Science, Reims, Sept. 2013- June 2016

**Mathematics (Levels BAC+1)**

**Matlab (Levels BAC+2)**

Activities - Elected representative for the PhD student of the LMR, since sept. 2013

- Co-organizer of the seminar "Jeunes Chercheurs" of the LMR, since sept. 2013

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## Education

- 2012 **Secondary school teaching qualification in Mathematics**, *Faculty of Science*, Reims.
- 2011 **2nd year of Master's degree in Mathematics Modelisation**, *Faculty of Science*, Reims, grade A pass (16/20).  
**Internship:** Topological correction of 3D cerebral vascular structures  
Supervisors : S. Salmon, H. Talbot and N. Passat of LSIIT (Strasbourg)  
**End-of-studies project:** Enhancement of texte in camera phones images  
Implementation in Matlab and C++ of two algorithms developed by M. El Rhabi
- 2010 **1st year of Master's degree in Applied Mathematics**, *Faculty of Science*, Reims, grade B pass (13,48/20).  
**Survey and research work:** Mathematical modelling of crowd control  
Survey of the microscopic model proposed in the PhD of Juliette Venel
- 2009 **License's degree in Mathematics**, *Faculty of Science*, Reims, grade C pass (2nd year: 12,3/20 and 3st year: 11,27/20).
- 2007 **Technical University Diploma in Computer Science option digital imaging**, *IUT*, Reims, grade B pass (1st year: 14,47/20 and 2nd year: 13,43/20).  
**Project :** Creation of a websiste for the beauty salon Effet Mince in Reims
- 2005 **Scientific Baccalauréat speciality Mathematics**, *High School Jean Jaurès*, Reims, grade B pass (15/20).

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## Work experience

- March 12 - 24 **Internship**, *Vocational college François 1er*, Vitry-le-François,  
2012 Taking over 4 Vocational Training classes and 2 Professional Bac classes.
- Jan. 30 - Feb. 4 **Observation and accompanied practice internship**, *College François Legros*, Reims,  
2012 Taking over a sixth grade class.
- October 2011 **University Library agent**, *Faculty of Science*, Reims,  
- June 2012 Readers reception and information, communication of documents in storage.
- April - Sept. **Intership of Master**, *ESIEE*, Champs-sur-Marne,  
2011 Topological correction of 3D cerebral vascular structures.
- 2008 - 2011 **Private tutoring in Mathematiqucs for school students**, *Reims*.
- Apri l- June **Intership of IUT**, *pc@ssistance society*, Reims,  
2007 Creation of a website for the computer maintenance society.

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## Computer science skills

Languages	C, C++, Java, Fortran, Python, Matlab, Scilab	Web	HTML, CSS, PHP, Javascript
Software	Itk-Snap, MedInria, Avizo, Medipy, Comsol, Ansys Fluent, FreeFem++, Abaqus, Logiciel R	Librairy	Clmg, OpenCV, VTK, Pink, OpenMP
Office	Word, PowerPoint, Excel, Publisher, Access, LaTeX, OpenOffice	OS	Windows (XP), Linux (Ubuntu), Mac OS (X)

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## Languages

- English **reading, writing and speaking**  
German **basic concepts**