

# OLIVIER MERCIER

olivier-mercier.com  
oli.mercier@gmail.com

## WORK EXPERIENCE

---

### Facebook Reality Labs

*Research Scientist - Display Systems Research*

2018 - Current

*Redmond, WA, USA*

- Use computer graphics, mathematics, optimization, and numerical analysis to develop technologies for novel head-mounted display systems

## EDUCATION

---

**University of Montreal** - supervised by Derek Nowrouzezahrai

2013 - 2018

Ph.D. Computer Science - Iterative Solvers for Physics-based Simulations and Displays

**McGill University** - supervised by Jean-Christophe Nave

2011 - 2013

Master of Sciences - Applied Mathematics - Numerical PDEs - 4.0/4.0 GPA

**University of Montreal**

2008 - 2011

Bachelor of Science - Pure and Applied Mathematics - 4.24/4.30 GPA - Mention of Excellence

## INTERNSHIPS

---

### Pixar Animation Studios

*Research Intern - supervised by Theodore Kim*

January 2017 - April 2017

*Emeryville, CA, USA*

- Investigated upres methods for viscous fluid simulations

### Oculus Research

*Research Intern - supervised by Douglas Lanman*

June 2016 - December 2016

*Redmond, WA, USA*

- Improved a decomposition method for multifocal displays (1000x faster than previous work)
- Developed software to control and render to a multifocal testbed

### Autodesk

*Intern Researcher - supervised by Jos Stam*

May 2014 - August 2014

*Toronto, ON, Canada*

- Implemented the Wavelet Turbulence method inside Maya's fluid solver
- Explored new algorithms for real-time smoke simulations

## SELECTED AWARDS

---

- 2019** Alain Fournier Award – **Best Canadian doctoral dissertation in computer graphics**
- 2017** University of Montreal FESP Hydro-Quebec Excellence Award
- 2014/5** U. Montreal’s Dept. of Comp. Sci. and Operations Research Excellence Award
- 2013** Natural Sciences and Engineering Research Council of Canada (NSERC) CGS-D Alexander Graham Bell Scholarship – 16th place mathematics
- 2013** Fonds de Recherche du Québec Nature et Technologies (FRQNT) – B2 Doctoral Scholarship – 1st place computer science
- 2011** FRQNT – B1 Masters Scholarship– 1st place mathematics
- 2011** NSERC CGS-M Alexander Graham Bell Scholarship

## SELECTED PUBLICATIONS AND TALKS

---

- Xi-Yuan Yin, **Olivier Mercier**, Badal Yadav, Kai Schneider, Jean-Christophe Nave, *A Characteristic Mapping Method for the two-dimensional incompressible Euler equations*, J. of Comp. Physics, 2021.
- Changwon Jang, **Olivier Mercier**, Kiseung Bang, Gang Li, Yang Zhao, Douglas Lanman, *Design and Fabrication of Freeform Holographic Optical Elements*, ACM TOG (SIGGRAPH Asia), 2020.
- **Olivier Mercier**, Derek Nowrouzezahrai, *Local Bases for Model-reduced Smoke Simulations*, Eurographics, 2020.
- **Olivier Mercier**, Xi-Yuan Yin, Jean-Christophe Nave, *The Characteristic Mapping Method for the Linear Advection of Arbitrary Sets*, SIAM Journal on Scientific Computing, 2020
- **O. Mercier**, *Iterative Solvers for Physics-based Simulations and Displays*, Ph.D. Thesis, 2018.
- **O. Mercier**, Y. Sulai, K. Mackenzie, M. Zannoli, J. Hillis, D. Nowrouzezahrai, D. Lanman, *Fast Gaze-Contingent Optimal Decompositions for Multifocal Displays*, ACM TOG (SIGGRAPH Asia), 2017.
- **O. Mercier**, C. Beauchemin, T. Kim, N. Thuerey, D. Nowrouzezahrai, *Surface Turbulence for Particle-Based Liquid Simulations*, ACM TOG (SIGGRAPH Asia), 2015.
- **O. Mercier**, *Numerical Methods for Set Transport and Related Partial Differential Equations*, Master’s Thesis, 2013.

## TECHNICAL SKILLS

---

<b>Programming Languages</b>	C++, Python, JavaScript, Java, Processing, Lua
<b>APIs and Other Languages</b>	OpenGL, DirectX, WebGL, OpenMP, LaTeX
<b>Tools and Softwares</b>	Mathematica, Blender, Houdini, Perforce/Git/Mercurial
<b>Development Environments</b>	Visual Studio, QT Creator, Eclipse, Shadertoy, Raspberry Pi