

# Pierre-Yves Laffont

*Researcher and Entrepreneur*

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## Current position

I am the **CEO and co-founder** of **Lemnis Technologies**, a deep technology startup based in Singapore. We tackle the causes of Virtual Reality discomfort, and in particular the vergence-accommodation conflict. We strive to make prolonged use of Virtual Reality possible and enable applications beyond gaming and entertainment.

## Research interests

### **Computer Vision, Computer Graphics, Image Processing**

Selected topics: virtual/augmented reality, telepresence, image-based rendering, intrinsic image decomposition, high-level image editing, scene attributes, example-based appearance transfer, physically-based methods.

## Education

- Oct, 2012 **Inria / University of Nice Sophia-Antipolis**, France  
Doctorate degree in Computer Science  
Thesis: Intrinsic image decomposition from multiple photographs
- Sep, 2009 **INSA Lyon (National Institute of Applied Sciences)**, France  
Master's degree in Telecommunications (French *Diplôme d'Ingénieur*)  
Master's degree in Electrical Engineering (French *Master Recherche*)

## Research experience

- Mar, 2014–  
Sep, 2016 **ETH Zurich**, Switzerland  
*Postdoctoral researcher*  
Group leader: Markus Gross
- Jun, 2014–  
Aug, 2016 **Nanyang Technological University**, Singapore  
*Visiting researcher*  
Project principal investigators: Cham Tat Jen, Henry Fuchs, Markus Gross
- Nov, 2012–  
Feb, 2014 **Brown University**, Providence, USA  
*Postdoctoral research associate*  
Group leader: James Hays
- Jul, 2011–  
Aug, 2011 **Massachusetts Institute of Technology**, Cambridge, USA  
*Visiting student researcher*  
Advisors: Frédo Durand, Sylvain Paris (**Adobe**)

- Jul, 2010– **University of California**, Berkeley, USA  
Aug, 2010 *Visiting student researcher*  
Advisor: Maneesh Agrawala
- Oct, 2009– **Inria Sophia-Antipolis**, France – REVES research group  
Oct, 2012 *Doctoral student researcher*  
Advisors: George Drettakis, Adrien Bousseau
- Feb, 2009– **INSA Lyon**, France – LIRIS Laboratory  
Aug, 2009 & **KAIST**, Daejeon, South Korea – Scalable Graphics Lab  
*Master student researcher*  
Advisors: Sung-eui Yoon, Christian Wolf, Khalid Idrissi
- Feb, 2008– **KAIST**, Daejeon, South Korea – Robotics and Computer Vision Lab  
Dec, 2008 *Undergraduate research assistant / intern*  
Advisors: Jean-Charles Bazin, Inso Kweon

## Awards

- Dec, 2015 **Outstanding Reviewer Award**, ICCV 2015  
International Conference on Computer Vision, Santiago, Chile
- Feb, 2013 **Spotlight paper**, IEEE TVCG journal  
“Rich Intrinsic Image Decomposition of Outdoor Scenes from Multiple Views” [6]
- Oct, 2011 **Best Paper Award** at *Journées de l’AFIG 2011*, Bidart, France  
“Images intrinsèques de scènes en extérieur à partir de multiples vues” [17] (in French)
- Oct, 2009– **Inria CORDI-S doctoral scholarship**  
Sep, 2012 Ranked 1 out of 18 pre-selected candidates (acceptance rate 17%)
- Sep, 2009 **Valedictorian**, INSA Lyon, Telecommunications department  
First in a class of 81, graduated with highest honors (French *félicitations du Jury*)
- May, 2007 & **Finalist, Prologin National Programming Contest**  
May, 2009 organized by *EPITA* and *École polytechnique*, Paris, France

## Publications

### Thesis

- [1] **Laffont P.Y.** Intrinsic image decomposition from multiple photographs. Ph.D. thesis, Inria Sophia-Antipolis, October 2012.

### In peer-reviewed international journals

- [2] Zhang Q., Guo Y., **Laffont P.Y.**, Martin T., and Gross M. A virtual try-on system for prescription eyeglasses. *IEEE Computer Graphics and Applications*, 37(4), 2017.
- [3] Zhang Q., **Laffont P.Y.**, and Sim T. Lighting transfer across multiple views through local color transforms. *Computational Visual Media*, 3(4), 2017.

- [4] Duchêne S., Riant C., Chaurasia G., Lopez-Moreno J., **Laffont P.Y.**, Popov S., Bousseau A., and Drettakis G. Multiview intrinsic images of outdoors scenes with an application to relighting. *ACM Transactions on Graphics*, 34(5), 2015. **Presented at SIGGRAPH 2016**, Anaheim.
- [5] **Laffont P.Y.**, Ren Z., Tao X., Qian C., and Hays J. Transient attributes for high-level understanding and editing of outdoor scenes. *ACM Transactions on Graphics (proc. of SIGGRAPH)*, 33(4), 2014. **Presented at SIGGRAPH 2014**, Vancouver. Acceptance rate: 25%.
- [6] **Laffont P.Y.**, Bousseau A., and Drettakis G. Rich intrinsic image decomposition of outdoor scenes from multiple views. *IEEE Transactions on Visualization and Computer Graphics*, 19(2), 2013. Selected as the **Spotlight Paper** for the February 2013 issue. **Presented at SIGGRAPH 2012**, Los Angeles (Poster and Talk programs).
- [7] **Laffont P.Y.**, Bousseau A., Paris S., Durand F., and Drettakis G. Coherent intrinsic images from photo collections. *ACM Transactions on Graphics (proc. of SIGGRAPH Asia)*, 31(6), 2012. **Presented at SIGGRAPH Asia 2012**, Singapore. Acceptance rate: 24%.
- [8] Bosch C., **Laffont P.Y.**, Rushmeier H., Dorsey J., and Drettakis G. Image-guided weathering: A new approach applied to flow phenomena. *ACM Transactions on Graphics*, 30(20), 2011. **Presented at SIGGRAPH 2011**, Vancouver.
- [9] Vangorp P., Chaurasia G., **Laffont P.Y.**, Fleming R., and Drettakis G. Perception of visual artifacts in image-based rendering of façades. *Computer Graphics Forum (proc. of Eurographics Symposium on Rendering 2011)*, 30(4), 2011. Acceptance rate: 39%.

### In peer-reviewed international conference proceedings

- [10] Stevens R.E., Rhodes D., Hasnain A., and **Laffont P.Y.** Varifocal technologies providing prescription and VAC mitigation in HMDs using Alvarez lenses. In *Proc. of SPIE Photonics Europe*. 2018. In press.
- [11] Hu S., **Laffont P.Y.**, Price B., Cohen S., and Brown M.S. Expanding Color Query Results via Image Recoloring. In *Proc. of Eurographics*. 2017. **Presented at Eurographics 2017**, Lyon (Short Papers program).
- [12] Plüss C., Ranieri N., Bazin J.C., Martin T., **Laffont P.Y.**, Popa T., and Gross M. An immersive bidirectional system for life-size 3D communication. In *Proc. of the International Conference on Computer Animation and Social Agents (CASA)*. Geneva, 2016.
- [13] Zhang Q., **Laffont P.Y.**, and Sim T. Lighting transfer across multiple views through local color transforms. In *Proc. of SIGGRAPH Asia*. 2016. **Presented at SIGGRAPH Asia 2016**, Macau (Technical Brief program).
- [14] **Laffont P.Y.** and Bazin J.C. Intrinsic decomposition of image sequences from local temporal variations. In *Proc. of International Conference on Computer Vision*. 2015. **Presented at ICCV 2015**, Santiago. Acceptance rate: 30.9%.
- [15] Bazin J.C., **Laffont P.Y.**, Kweon I.S., Demonceaux C., and Vasseur P. An original approach for automatic plane extraction by omnidirectional vision. In *Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. Taipei, 2010. Acceptance rate: 58.2%.
- [16] **Laffont P.Y.**, Jun J.Y., Wolf C., Tai Y.W., Idrissi K., Drettakis G., and Yoon S.e. Interactive content-aware zooming. In *Proc. of Graphics Interface (GI)*. Ottawa, 2010. Acceptance rate: 38%.

## In peer-reviewed domestic journals

- [17] **Laffont P.Y.**, Bousseau A., and Drettakis G. Images intrinsèques de scènes en extérieur à partir de multiples vues. *REFIG (Revue Electronique Francophone d'Informatique Graphique)*, 5(2), 2011. In French. Presented at *Journées de l'AFIG 2011*, **best paper award**. Acceptance rate: 25%.

## Abstracts

- [18] **Laffont P.Y.** and Hasnain A. Adaptive Dynamic Refocusing: Toward Solving Discomfort in Virtual Reality. In *Proc. of SIGGRAPH. 2017*. Emerging Technologies and Experience Presentations programs.
- [19] **Laffont P.Y.**, Martin T., Gross M., Tan W.D., Lim C., Au A., and Wong R. Rectifeye: A vision-correcting system for Virtual Reality. In *Proc. of SIGGRAPH Asia. 2016*. Poster and Virtual Reality Showcase programs.
- [20] **Laffont P.Y.** and Hays J. Exploring outdoor appearance changes with transient scene attributes. In *Proc. of SIGGRAPH Asia. 2013*. Poster program.
- [21] **Laffont P.Y.**, Bousseau A., and Drettakis G. Rich intrinsic image decomposition of outdoor scenes from multiple views. In *Proc. of SIGGRAPH. 2012*. Poster and Talk programs.

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## Research activities

### Projects and collaborations

- Mar, 2014–  
Aug, 2016 **BeingThere Centre**  
International research centre for tele-presence and tele-collaboration. With ETH Zurich in Switzerland, Nanyang Technological University in Singapore, and University of North Carolina Chapel Hill in USA; funded by the Singapore National Research Foundation.
- Nov, 2012–  
Feb, 2014 **IARPA Finder Program** – *ObjectVideo* team  
Geolocation of outdoor images on the land surface of the world using publicly-available information. With Brown University and partner institutions in the US; funded by IARPA.
- Feb, 2012–  
Oct, 2012 **Collaboration with Autodesk**  
Technology transfer and development based on the intrinsic image decomposition method I developed during my PhD at Inria [6].
- Oct, 2011–  
Oct, 2012 **EU Project VERVE**  
Creation of personalized and realistic virtual environments to support the treatment of people at risk of social exclusion. With Inria and partners in healthcare and academia in France, UK, Italy, Spain and Germany; coordinated by Trinity College Dublin and funded under the EU FP7 framework.

### Academic service

#### Member of Program Committee for:

- High Performance Graphics (HPG) – 2015
- CAD/Graphics – 2015
- Web3D – 2016

**Reviewer for:**

- SIGGRAPH – 2013, 2015, 2016
- SIGGRAPH Asia – 2015
- Eurographics – 2014, 2016
- EGSR (Eurographics Symposium on Rendering) – 2014
- CVPR (Computer Vision and Pattern Recognition) – 2015, 2016
- ICCV (International Conference on Computer Vision) – 2015 (**outstanding reviewer award**)
- ECCV (European Conference on Computer Vision) – 2016
- ACCV (Asian Conference on Computer Vision) – 2016
- TVCG (Transactions on Visualization and Computer Graphics) – 2012
- TCSVT (Transactions on Circuits and Systems for Video Technology) – 2013, 2014
- CVIU (Computer Vision and Image Understanding) – 2012, 2013
- CGF (Computer Graphics Forum) – 2015, 2016
- The Visual Computer – 2014
- Pacific Graphics – 2012, 2013, 2014
- Graphics Interface – 2013, 2014, 2016
- VRST (Symposium on Virtual Reality Software and Technology) – 2017

**Student volunteer** at SIGGRAPH Asia 2010

## Supervision

**Master students:**

- Xiaofeng Tao, Brown University – now at Microsoft
- Chao Qian, Brown University – now at Amazon

**Research staff:**

- Guo Yu, NTU Singapore – now at UC Irvine
- Qian Zhang, NTU Singapore

## Invited talks and conferences

### Conference oral presentations

- Apr 25, 2018 **SPIE Photonics Europe**, Strasbourg, France  
Digital Optics for Immersive Displays – **invited talk**  
“Varifocal technologies providing prescription and VAC mitigation in HMDs using Alvarez lenses” [10]
- Nov 28, 2017 **SIGGRAPH Asia 2017**, Bangkok, Thailand – VR Talks  
“Correcting Focus for Virtual Reality”
- Jul 30, 2017 **SIGGRAPH 2017**, Los Angeles, USA – Experience Presentations  
“Adaptive dynamic refocusing: toward solving discomfort in Virtual Reality” [18]

- Dec 5, 2016 **SIGGRAPH Asia 2016**, Macau  
Workshop on Virtual Reality Meets Physical Reality – **invited speaker**  
“What about eyeglasses? Beyond one-form-fits-all Virtual Reality”
- Aug 14, 2014 **SIGGRAPH 2014**, Vancouver, Canada  
“Transient attributes for high-level understanding and editing of outdoor scenes” [5]
- Dec 1, 2012 **SIGGRAPH Asia 2012**, Singapore  
“Coherent intrinsic images from photo collections” [7]
- Aug 9, 2012 **SIGGRAPH 2012**, Los Angeles, USA  
“Rich intrinsic image decomposition of outdoor scenes from multiple views” [6]
- Oct 14, 2011 Journées de l’AFIG 2011, Bidart, France  
“Images intrinsèques de scènes en extérieur à partir de multiples vues” [17] (in French)  
**Best paper award**
- May 31, 2010 Graphics Interface 2010, Ottawa, Canada  
“Interactive content-aware zooming” [16]

### Conference poster presentations

- Dec 6-8, 2016 **SIGGRAPH Asia 2016**, Macau, China  
“Rectifeye: A vision-correcting system for Virtual Reality” [19]
- Dec 13-16, 2015 **ICCV 2015**, Santiago, Chile  
“Intrinsic decomposition of image sequences from local temporal variations” [14]
- Nov 19-22, 2013 **SIGGRAPH Asia 2013**, Hong Kong  
“Exploring outdoor appearance changes with transient scene attributes” [20]
- Aug 5-9, 2012 **SIGGRAPH 2012**, Los Angeles, USA  
“Rich intrinsic image decomposition of outdoor scenes from multiple views” [21]

### Demonstrations

- Jan 29, 2018 **SPIE Photonics West**, San Francisco, USA  
Demo booth at Augmented, Virtual, and Mixed Reality Conference
- Jul 30- Aug 3, 2017 **SIGGRAPH 2017**, Los Angeles, USA – Emerging Technologies  
“Adaptive dynamic refocusing: toward solving discomfort in Virtual Reality” [18]
- May 11, 2017 **SCIEN Workshop on Augmented and Mixed Reality**, Stanford, USA  
“Solving the vergence-accommodation conflict in Virtual Reality”
- Dec 6-8, 2016 **SIGGRAPH Asia 2016**, Macau, China – Virtual Reality Showcase  
“Rectifeye: A vision-correcting system for Virtual Reality” [19]

### Invited talks

- Aug 19, 2016 **Adobe**, San Jose, USA  
Host: Kalyan Sunkavalli
- Aug 10, 2016 **Adobe**, Seattle, USA  
Host: Eli Shechtman

- Aug 5, 2016 **Google**, Seattle, USA  
Host: Aseem Agarwala
- Aug 2, 2016 **Nvidia**, Westford, USA  
Host: Jan Kautz
- Apr 8, 2016 **KAIST**, Daejeon, South Korea  
Host: Inso Kweon
- Apr 8, 2016 **KAIST**, Daejeon, South Korea  
Host: Sung-eui Yoon
- Apr 1, 2016 **De la Salle University**, STC campus, Laguna, Philippines  
Host: Conrado Ruiz
- Sep 23, 2015 **INSA Lyon (National Institute of Applied Sciences)**, France – LIRIS lab  
Host: Victor Ostromoukhov
- Oct 7, 2014 **KETI (Korea Electronics Technology Institute)**, Seoul, South Korea  
Host: Youngbae Hwang
- Sep 30, 2014 **National University of Singapore** – School of Computing  
Host: Low Kok Lim
- Jul 22, 2014 **Nanyang Technological University**, Singapore – Institute for Media Innovation  
Host: Nadia Magnenat Thalmann
- Oct 15, 2013 **ETH Zurich**, Switzerland  
Host: Markus Gross
- Oct 11, 2013 **Max Planck Institute for Intelligent Systems**, Tübingen, Germany  
Host: Peter Gehler
- Oct 9, 2013 **Max Planck Institute for Informatics**, Saarbrücken, Germany  
Host: Christian Theobalt
- Mar 13, 2013 **Massachusetts Institute of Technology**, Cambridge, USA  
Host: Frédo Durand
- Mar 1, 2013 **Brown University**, Providence, USA – Cognitive Linguistic & Psychological Sciences dept.  
Host: Thomas Serre
- Dec 27, 2012 **Gwangju Institute of Science and Technology**, South Korea  
Host: Kuk-Jin Yoon
- Dec 26, 2012 **Seoul National University**, South Korea  
Host: Jehee Lee
- Aug 10, 2012 **University of Washington**, Seattle, USA  
Hosts: Steven Seitz and Ira Kemelmacher-Shlizerman
- Jun 19, 2012 **Paris ACM SIGGRAPH**, France
- Feb 23, 2012 **KAIST**, Daejeon, South Korea  
Host: Sung-eui Yoon

## Courses taught

- Spring 2012 **Polytech’Nice - Sophia**, France – Mundus Bridging program  
*Object Oriented Programming*  
Taught labs in Java (32 hours) and mentored final-year projects in an international programme with Chinese students from different departments
- Fall 2011 **Polytech’Nice - Sophia**, France – Computer Science department  
*Object Oriented Programming*  
Taught labs in Java (32 hours) for third year Computer Science undergraduate students; prepared and graded written exams

## Guest lectures

- Aug 3, 2016 **Massachusetts Institute of Technology**, Cambridge, USA – *CEU Advances in Imaging*  
Instructor: Ramesh Raskar
- Apr 7, 2016 **KAIST**, Daejeon, South Korea – *CS580 Computer Graphics*  
Instructor: Sung-eui Yoon
- Mar 30, 2016 **De la Salle University**, Manila, Philippines – *CTTREND Trends in Computer Science*  
Instructor: Clement Ong
- Mar 29, 2016 **De la Salle University**, Manila, Philippines – *CSC930 Computer Vision*  
Instructor: Joel Ilao
- Dec 3, 2012 **Brown University**, Providence, USA – *CS129 Computational Photography*  
Instructor: James Hays

## Software and IT skills

- Coding Matlab, C/C++, Java, Python, LaTeX
- Libraries OpenCV, OpenGL, PBRT physically-based raytracer, MechanicalTurk crowdsourcing API
- Web PHP, HTML, JavaScript, CSS, Apache, jQuery, web.py framework
- Technology transfer Developed *Rich Intrinsic Decomposer* and *Sparse Irradiance Estimator* software packages, which are registered with the French Agency for the Protection of Programs (APP).  
**These technologies have been transferred to industry (Autodesk).**

## Languages

- English **Fluent**, lived two years in USA, TOEIC score: 990/990
- French **Native speaker**
- German **Intermediate**, CEF level B1
- Korean **Basic**, lived 2 years in Korea