Pierre-Yves Laffont

Researcher and Entrepreneur

Lemnis Technologies
80 Changi road #05-01
419715 Singapore
✉ *contact@py-laffont.info*
http://www.py-laffont.info

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–
Aug, 2010
University of California, Berkeley, USA
Visiting student researcher
Advisor: Maneesh Agrawala

Oct, 2009–
Oct, 2012
Inria Sophia-Antipolis, France – REVES research group
Doctoral student researcher
Advisors: George Drettakis, Adrien Bousseau

Feb, 2009–
Aug, 2009
INSA Lyon, France – LIRIS Laboratory
& **KAIST**, Daejeon, South Korea – Scalable Graphics Lab
Master student researcher
Advisors: Sung-eui Yoon, Christian Wolf, Khalid Idrissi

Feb, 2008–
Dec, 2008
KAIST, Daejeon, South Korea – Robotics and Computer Vision Lab
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–
Sep, 2012
Inria CORDI-S doctoral scholarship
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 &
May, 2009
Finalist, Prologin National Programming Contest
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.

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

Teaching activities

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