



# Alexandre Chapiro

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I am interested in perception and computer graphics, especially anything involving computational display and psychophysics. Prior work involved perceptual metrics, brightness and color, stereo 3D, and display topics like virtual and augmented reality, frame rate, high dynamic range and more.

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## Professional Experience

2020-now **Facebook Reality Labs | Applied Perception Science Team**

Senior Researcher Advance understanding of perception through targeted research and publications.  
Apply learnings to product paths, work cross-functionally to support product needs

2018-2020 **Apple Inc., Cupertino | Core Display Incubation Team**

Senior Display Engineer Helped identify and cultivate new display technologies and associated experiences to surprise and delight Apple product users

2017-2018 **Dolby Laboratories | Applied Vision Science Group**

Senior Researcher Conducted research and obtained experimental results on perceptual factors, mainly focusing on cinema and home theater applications

2011-2016 **Disney Research, Zurich | Stereo and Displays Group**

Researcher In parallel with my doctoral studies, conducted research on display and perception topics resulting in four patent applications and several publications

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## Education

2011-2015 **PhD in Computer Science | Computer Graphics Laboratory**

institution Federal Institute of Technology Zurich (ETHZ), Zurich, Switzerland

thesis title *Perceptual Enhancements for Novel Displays*

supervisors Prof. Markus Gross. Co-Advisor: Dr. Aljoša Smolić

2010-2011 **Masters' Degree in Applied Mathematics | Visgraf Laboratory**

institution Institute of Pure and Applied Mathematics (IMPA), Rio de Janeiro, Brazil

thesis title *Improving Mobile Video*

supervisors Prof. Paulo Cezar Pinto Carvalho. Co-Advisor: Prof. Luiz Velho

2007–2009 **Undergraduate Degree in Mathematics**

institution Federal University of Juiz de Fora (UFJF), Juiz de Fora, Brazil

thesis title *An Introduction to Degree Theory*

supervisors Prof. Luiz Faria, Marcelo Bernardes Vieira

2016–2016 **Dolby Laboratories | Applied Vision Science Group**

Intern Conducted research on the human visual system guided by business unit needs

## Teaching

Feb.2014 **Teaching assistant**, *Math. Foundations of Computer Graphics and Vision*, ETHZ.  
to Jun.2014 Graduate class teaching mathematical techniques in visual computing

Feb.2015 **Teaching assistant**, *Math. Foundations of Computer Graphics and Vision*, ETHZ.  
to Jun.2015

Feb.2012 **Teaching assistant**, *Informatik 1*, ETHZ.  
to Jun.2012 Undergraduate class teaching fundamentals of informatics to engineering students

Feb.2013 **Teaching assistant**, *Informatik 1*, ETHZ.  
to Jun.2013

## Academic Honors

2015 Second youngest PhD to ever graduate from the CS department at ETH Zurich

2011 Finished 2-year Master's program at the National Institute of Pure and Applied Mathematics in 18 months

2009 Finished 4-year undergraduate program in Mathematics at the Federal University of Juiz de Fora in 3 years with the highest GPA in the graduating class

2007 Ranked 1st in admission examinations, Federal University of Juiz de Fora

2006 Gold Medalist, Brazilian Astronomy Olympiad

2006 Gold Medalist, Brazilian Mathematics Olympiad for Public School Students. 95th place among approximately 5.3 million students

2005 Gold Medalist, Brazilian Mathematics Olympiad for Public School Students. 9th place among approximately 3.8 million students

## Academic Service

Committee **2022**, IST HVEI International Program Committee.  
**2021**, SIBGRAPI Journal Track International Program Committee.  
**2019**, SIBGRAPI Journal Track International Program Committee.  
**2018**, SIBGRAPI International Program Committee.

Reviewing SIGGRAPH (2022, 2021, 2019, 2017, 2015), SIGGRAPH Asia (2022, 2016, 2015), Eurographics (2020, 2019, 2018), IEEE TIP (2020, 2019, 2017, 2016), SIBGRAPI (2021, 2019, 2018), Pacific Graphics (2017, 2014), Graphics Interface (2016), JOSA (2016), ICIP (2015), IEEE CG&A (2015), IEEE TVCG (2015), CG Forum (2014), 3DV (2012)

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## Awards and Funding

- Oct.2011 to Oct.2013 **Participant**, *European Commission Program FP7*.
- Mar.2010 to Jul.2011 **Awarded**, *Master program fellowship, CNPq*.
- Jan.2009 to Dec.2009 **Awarded**, *Undergraduate research scholarship, FAPEMIG*.
- Jan.2008 to Dec.2008 **Awarded**, *Undergraduate research scholarship, CNPq*.
- Mar.2007 to Jan.2008 **Awarded**, *Scholarship for winners OBMEP 2006 mathematics olympics, CNPq*.
- Mar.2006 to Jan.2007 **Awarded**, *Scholarship for winners OBMEP 2005 mathematics olympics, CNPq*.
- Jan.2005 to Dec.2005 **Awarded**, *High-school research scholarship, CNPq*.

○ Obs.: CNPq is the Brazilian national funding agency. FAPEMIG is the funding agency for the state of Minas Gerais, Brazil

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## Invited Talks and Presentations

- invited talk: **Echoes of SIGGRAPH'20**.  
IMPA 2020, Brazil, hosted by Luiz Velho
- paper talk: **A Luminance-Aware Model of Judder Perception**.  
SIGGRAPH 2020
- invited talk: **Perceptual Enhancements for Novel Displays**.  
TU Delft 2019, Netherlands, hosted by Elmar Eisemann
- invited talk: **Cinematic Motion**.  
NAB show 2018, Las Vegas, invited by Jaclyn Pytlarz
- invited talk: **Perceptual Enhancements for Novel Displays**.  
IBM 2017, Rio de Janeiro, hosted by Emilio Vital Brazil
- invited talk: **Computer Graphics, (popular lecture)**.  
IF Sudeste MG 2017, Juiz de Fora, hosted by Elena Konstantinova
- invited talk: **Computer Graphics, (popular lecture)**.  
IF Sudeste MG 2016, Rio Pomba, hosted by Lucas Lattari
- invited talk: **Perceptual Enhancements for Novel Displays**.  
Dolby Laboratories 2016, Sunnyvale, hosted by Timo Kunkel
- invited talk: **Perceptual Enhancements for Novel Displays**.  
Technicolor 2015, Rennes, hosted by Erik Reinhard
- invited talk: **Perceptual Enhancements for 3D Displays**.  
Max Planck Institut 2015, Saarbrücken, hosted by Piotr Didyk
- paper talk: **Stereo from Shading**.  
EGSR 2015

paper talk: **Perceptual Evaluation of Cardboarding in 3D Content Visualization.**

SAP 2015

paper talk: **Optimizing Stereo-to-Multiview Conv. for Autostereo. Displays.**

Eurographics 2015

## Languages

Portuguese Fluent *Native speaker*

Russian Fluent *Native speaker*

English Fluent *TOEFL iBT 117/120, Cambridge FCE and CAE exams with A grades*

Spanish Fluent *3 years of school in Spain*

French Advanced *Alliance Française DELF diplôme - 2005*

## Publications

### Papers

#### **Geo-metric: A Perceptual Dataset of Distortions on Faces**

ACM Transactions on Graphics, Proceedings of SIGGRAPH Asia 2022

Wolski, Trutoiu, Dong, Shen, MacKenzie, Chapiro

#### **Realistic Luminance in VR,**

SIGGRAPH Asia, 2022, conference track

Matsuda\*, Chapiro\*, Zhao, Smith, Bachy, Lanman (\* = equal contribution)

#### **stelaCSF-A Unified Model of Contrast Sensitivity as the Function of Spatio-Temporal Frequency, Eccentricity, Luminance and Area,**

ACM Transactions on Graphics, Proceedings of SIGGRAPH 2022

Mantiuk, Ashraf, Chapiro

#### **FovVideoVDP: A visible difference predictor for wide field-of-view video**

ACM Transactions on Graphics, Proceedings of SIGGRAPH 2021

Mantiuk, Denes, Chapiro, Kaplanyan, Rufo, Bachy, Lian, Patney

#### **A Luminance-Aware Model of Judder Perception,**

ACM Transactions on Graphics, Presented at SIGGRAPH 2020

Chapiro, Atkins, Daly

#### **Influence of Screen Size and Field of View on Perceived Brightness**

ACM Transactions on Applied Perception (TAP) , 2018

Chapiro, Kunkel, Atkins, Daly

#### **Unfolding the 8-bit Era,**

European Conference on Visual Media Production 2015

Zund, Berard, Chapiro, Schmid, Ryffel, Bermanno, Gross, Sumner

### **Art-Directable Continuous Dynamic Range Video**

Computers & Graphics, Elsevier, 2015

Chapiro, Aydin, Stefanoski, Croci, Smolic, Gross

### **Video Content and Structure Description Based on Keyframes, Clusters and Storyboards**

IEEE International Workshop on Multimedia Signal Processing, Xiamen-China, 2015

Junyent, Beltran, Farre, Pont-Tuset, Chapiro, Smolic

### **Stereo from Shading**

Eurographics Symposium on Rendering, Darmstadt-Germany, 2015, E&I track

Chapiro, O'Sullivan, Jarosz, Gross, Smolic

### **Perceptual Evaluation of Cardboarding in 3D Content Visualization,**

ACM Symposium on Applied Perception, Vancouver-Canada, 2014, short paper

Chapiro, Diamanti, Poulakos, O'Sullivan, Smolic, Gross

### **Optimizing Stereo-to-Multiview Conversion for Autostereoscopic Displays**

Eurographics, Strasbourg-France, 2014

Chapiro, Heinzle, Aydin, Poulakos, Zwicker, Smolic, Gross

### **Towards Mobile HDR Video,**

Eurographics, Llandudno-UK, 2011. (Extended abstract)

Castro, Chapiro, Cicconet, Velho

### **Detection of High Frequency Regions in Multiresolution**

International Conference on Image Processing, Cairo-Egypt, 2009

Mota, Perez, Castro, Chapiro, Vieira

### **High Frequency Assessment from Multiresolution Analysis**

International Conference on Computational Science, Baton Rouge-USA, 2009

Castro, Perez, Mota, Chapiro, Vieira, Freire

## **Patents**

### **Peripheral luminance or color remapping for power saving**

US Patent US0011858 A1, 2022

Yang, Chapiro, Agaoglu, Bonnier, Huang, Wang, Watson, Mascarenhas

### **Frame rate conversion metadata**

US Patent US11019302 B2, 2020

Pytlarz, Atkins, Pieri, Chapiro, Daly

### **Luminance adaption to minimize discomfort and improve visibility**

US Patent US 20200202814 A1, 2020

Chapiro, Atkins, Daly

### **Virtual reality cinema-immersive movie watching for headmounted displays**

US Patent US10769754 B2, 2020

Chapiro, Atluru, Chun, Haricharan, Rozzi, Ruggieri, Ninan

### **Systems and methods for automatic key frame extraction and storyboard interface generation for video**

US Patent US9552520 B1, 2017 (Related to our 2015 paper)

Smolic, Martin, Pont-Tuset, Chapiro, Guiu

### **Methods for creating and distributing art-directable continuous dynamic range video**

US20160353164 A1, 2016 (Related to our 2015 paper)

Smolic, Chapiro, Croci, Aydin, Stefanoski, Gross

### **Visual salience of online video as a predictor of success**

US20170061235 A1, 2015 (Related to our 2015 poster)

Frey, Accardo, Sumner, Huber, Chapiro

### **Depth modification for display applications**

US20150348273 A1, 2015 (Related to our 2014 paper)

Chapiro, Aydin, Poulakos, Heinzle, Smolic

*Two additional patents currently in review*

## **Book Chapters**

### **Discrete Wavelets on Edges**

InTech open publisher, 2011

Chapiro , Knop, Mota, Perez, Bernardes, Freire

## **Posters**

### **The Influence of Visual Salience on Video Consumption Behavior**

#### **A Survival Analysis Approach,**

ACM Web Science, Oxford-United Kingdom, 2015

Huber, Scheibehenne, Chapiro, Frey, Sumner

### **Filter Based Deghosting for Exposure Fusion Video**

SIGGRAPH, Vancouver-Canada, 2011. *Student Research Competition Semi-Finalist*

Chapiro, Cicconet, Velho

### **Towards Mobile HDR Video**

International Conference on Computational Photography, Pittsburg-USA, 2011

Castro, Chapiro, Cicconet, Velho

### **Mountain's Pass Theorem**

Minas-Gerais Meeting of Partial Differential Equations, Itajuba-Brazil, 2009

Chapiro, Pereira

### **Other**

### **HDR VR**

E-tech demo, SIGGRAPH 2022

Matsuda, Zhao, Chapiro, Smith, Lanman

### **Image Domain Warping for Advanced 3D Video Applications**

IEEE COMSOC MMTC E - Letter, 2014, invited letter

Smolic, Wang, Lang, Stefanoski, Farre, Greisen, Heinzle, Schaffner, Chapiro, Sorkine-Hornung, Gross

### **Computational Photography**

IMPA, Rio de Janeiro-Brazil, 2011, technical report

Castro, Chapiro, Velho