Carlos Aliaga

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Education

Universidad de Zaragoza, Spain.

PhD Computer Science *2013 – 2017*

- Modeling and Perception of the Appearance of Virtual Humans.

MSc Computer Science *2012*

- MSc Thesis: A Biophysically Based Appearance Model for Skin Aging (9.5/10). Graduated with Honors.

Computer Science Engineer (BSc+MSc) *2005-2011*

- Graduation Project: Prefiltering indirect illumination in objects with complex geometry and reflectance (9/10).

Experience

Senior Research Scientist *Sausalito, California*
Meta Reality Labs Research *October 2019 - Present*

- Modeling and reconstruction of humans, focused on forward and inverse rendering of complex materials like skin, hair and cloth, often supported by AI solutions to retrieve retrieving both shape and materials.

Lead Scientist *Madrid, Spain*
Desilico Labs *Oct. 2017 – Mar. 2019*

- Led a group of 10 people focused on capturing, modeling and rendering the appearance of fabrics to create digital replicas of real garments.

Researcher *Madrid, Spain*
Universidad Rey Juan Carlos. *April–September 2017*

- Volumetric rendering of fiber level fabrics, both volumes and curve based. With Dr. Jorge López Moreno and Prof. Dr. Miguel A. Otaduy.

Researcher / PhD Student *Zaragoza, Spain*
Graphics & Imaging Lab. Universidad de Zaragoza *2010–2017*

- Modeling and perception of virutal humans. Under the supervision of Dr. Adrian Jarabo and Prof. Dr. Diego Gutierrez.

Research Intern *Rennes, France*
Technicolor *September-December 2016*

- Single image illuminants estimation.

Research Intern *Burbank, California*
Walt Disney Animation Studios *June-September 2016*

- Developing and art-directable micro-appearance model for efficient and photorealistic cloth rendering.

Research Intern *Burbank, California*
Walt Disney Animation Studios *June-December 2014*

- Evaluating the relative importance of appearance and dynamics in cloth perception.

Research Engineer *Porto, Portugal*
Porto's Science Faculty *June-August 2012*

- Real-time realistic skin rendering.
- Funded by European Commission Marie Curie Program, 7th Framework.

Publications

J. Zhu, C. Hery, L. Bode, ***C. Aliaga***, A. Jarabo, L.-Q. Yan, M. J.-Y. Chiang SIGGRAPH 2024

A Realistic Multi-scale Surface-based Cloth Appearance Model.

In ACM SIGGRAPH 2024 Conference Papers (SIGGRAPH '24). Association for Computing Machinery, New York, NY, USA, Article 89, 1–10. DOI: 10.1145/3641519.3657426 *

J. Zhu, A. Jarabo, ***C. Aliaga***, L.-Q. Yan, M. J.-Y. Chiang — SIGGRAPH 2023

A Realistic Surface-based Cloth Rendering Model.

In ACM SIGGRAPH 2023 Conference Proceedings (SIGGRAPH '23). Association for Computing Machinery, New York, NY, USA, Article 5, 1–9. DOI: 10.1145/3588432.3591554 *

C. Aliaga, M. Xia, X. Xie, A. Jarabo, G. Braun, C. Hery — EGSR 2023

A Hyperspectral Space of Skin Tones for Inverse Rendering of Biophysical Skin Properties.

Computer Graphics Forum 42, e14887 (2023). DOI: 10.1111/cgf.14887 *

A. KT, A. Jarabo, ***C. Aliaga***, M. J.-Y. Chiang, O. Maury, C. Hery, P. J. Narayanan, G. Nam — EGSR 2023

Accelerating Hair Rendering by Learning High-Order Scattered Radiance.

Computer Graphics Forum 42, e14895 (2023). DOI: 10.1111/cgf.14895 *

S. Zhu, S. Saito, A. Bozic, ***C. Aliaga***, T. Darrell, C. Lassner — arXiv 2023

Neural Relighting with Subsurface Scattering by Learning the Radiance Transfer Gradient.

arXiv preprint arXiv:2306.09322 (2023). arXiv:2306.09322 *

A. Weidlich, C. LeGendre, ***C. Aliaga***, C. Hery, J.-M. Aubry, J. Vorba, D. Siragusano, R. Kirk — SIGGRAPH Course 2022

Practical aspects of spectral data in digital content production.

In ACM SIGGRAPH 2022 Courses (SIGGRAPH '22). Association for Computing Machinery, New York, NY, USA, Article 11, i–96. DOI: 10.1145/3532720.3535632 *

C. Aliaga, C. Hery, M. Xia — arXiv 2022

Estimation of Spectral Biophysical Skin Properties from Captured RGB Albedo.

arXiv preprint arXiv:2201.10695 (2022). arXiv:2201.10695 *

T. Sun, G. Nam, ***C. Aliaga***, C. Hery, R. Ramamoorthi — EGSR 2021

Human Hair Inverse Rendering using Multi-View Photometric data.

In Eurographics Symposium on Rendering (2021). The Eurographics Association, 2021. DOI: 10.2312/sr.20211301 *

L. De Coster, P. Sánchez-Herrero, ***C. Aliaga***, M.A. Otaduy, J. Lopez-Moreno, A. Tajadura-Jimenez — Nature Sci. Rep. 2020

Perceived match between own and observed models' bodies: influence of face, viewpoints, and body size.

Sci Rep 10, 13991 (2020). DOI: 10.1038/s41598-020-70856-8 *

C. Castillo, J. López-Moreno, ***C. Aliaga*** — Computers & Graphics 2019

Recent advances in fabric appearance reproduction.

Comput. Graph. 84 (2019), 103–121. DOI: 10.1016/j.cag.2019.07.007 *

R. Alcain, C. Heras, I. Salinas, J. López, ***C. Aliaga*** — Photoptics 2019

Microscale Optical Capture System for Digital Fabric Recreation.

In Photoptics (2019), pp. 114–119.

A. Jarabo, ***C. Aliaga***, D. Gutierrez — SIGGRAPH 2018

A radiative transfer framework for spatially-correlated materials.

ACM Trans. Graph. 37, 4, Article 83 (August 2018), 13 pages. 10.1145/3197517.3201282 *

A. Alejandre, ***C. Aliaga***, J. Marco, A. Jarabo, A. Muñoz — MAM 2018

Towards Practical Rendering of Fiber-Level Cloth Appearance Models.

In Proceedings of the Workshop on Material Appearance Modeling (MAM '18). The Eurographics Association, 2018. DOI: 10.2312/mam.20181195 *

S. Duchêne, ***C. Aliaga***, T. Pouli, P. Pérez — NPAR 2017

Mixed illumination analysis in single image for interactive color grading.

In Proceedings of the Symposium on Non-Photorealistic Animation and Rendering (NPAR '17). Association for Computing Machinery, New York, NY, USA, Article 10, 1–10. DOI: 10.1145/3092919.3092927 *

C. Castillo, ***C. Aliaga***, J. López-Moreno — MAM 2017

Challenges in appearance capture and predictive modeling of textile materials.

In Proceedings of the Workshop on Material Appearance Modeling (MAM '17). Eurographics Association, Goslar, DEU, 21–24. DOI: 10.2312/mam.20171327 *

C. Aliaga, C. Castillo, D. Gutierrez, M. A. Otaduy, J. Lopez-Moreno, A. Jarabo — EGSR 2017

An Appearance Model for Textile Fibers.

Comput. Graph. Forum 36, 4 (July 2017), 35–45. DOI: 10.1111/cgf.13222 *

C. Aliaga, C. Castillo, D. Gutierrez, M. A. Otaduy, J. Lopez-Moreno, A. Jarabo SIGGRAPH Posters 2016

A fiber-level model for predictive cloth rendering.

In ACM SIGGRAPH 2016 Posters (SIGGRAPH '16). Association for Computing Machinery, New York, NY, USA, Article 66, 1–2. DOI: 10.1145/2945078.2945144 * ***3rd Place at the ACM Student Research Competition.***

E. Zell, ***C. Aliaga***, A. Jarabo, K. Zibrek, D. Gutierrez, R. McDonnell, M. Botsch SIGGRAPH 2015

To stylize or not to stylize? The effect of shape and material stylization on the perception of computer-generated faces.

ACM Trans. Graph. 34, 6, Article 184 (November 2015), 12 pages. 10.1145/2816795.2818126 *

J. A. Iglesias-Guitian, ***C. Aliaga***, A. Jarabo, D. Gutierrez Eurographics 2015

A Biophysically-Based Model of the Optical Properties of Skin Aging.

Comput. Graph. Forum 34, 2 (May 2015), 45–55. DOI: 10.1111/cgf.12540 *

C. Aliaga, C. O'Sullivan, D. Gutierrez, R. Tamstorf SAP 2015

Sackcloth or silk? The impact of appearance vs dynamics on the perception of animated cloth.

In Proceedings of the ACM SIGGRAPH Symposium on Applied Perception (SAP '15). Association for Computing Machinery, New York, NY, USA, 41–46. DOI: 10.1145/2804408.2804412 *

B. Masia, G. Wetzstein, ***C. Aliaga***, R. Raskar, D. Gutierrez Computers & Graphics 2013

Special Section on Advanced Displays: Display adaptive 3D content remapping.

Comput. Graph. 37, 8 (December 2013), 983–996. 10.1016/j.cag.2013.06.004 *

B. Masia, G. Wetzstein, ***C. Aliaga***, R. Raskar, D. Gutierrez SIGGRAPH Posters 2012

Perceptually-optimized content remapping for automultiscopic displays.

In ACM SIGGRAPH 2012 Posters (SIGGRAPH '12). Association for Computing Machinery, New York, NY, USA, Article 63, 1. DOI: 10.1145/2342896.2342973 *

Patents

C. Castillo, M. A. Otaduy, ***C. Aliaga***, J. López US Patent 2023

Procedural model of fiber and yarn deformation.

United States patent US 11,853,659 (2023).

C. Aliaga, R. Alcain, C. Heras, I. Salinas, S. Sergio, E. Garcés, J. López US Patent Application 2021

Micro scale image capture system.

United States patent application US 17/389,456 (2021).

Participation in Research Projects

VERVE. *Vanquishing fear and apathy through E-inclusion: Personalized and populated Realistic Virtual Environments for clinical, home and mobile platforms.*
Funded by European Commission. ICT Program, 7th Framework.
PI: Prof. Dr. Carol O'Sullivan, Prof. Dr. Diego Gutiérrez.

GOLEM. *Realistic Virtual Humans.*
Funded by European Commission Marie Curie Program, 7th Framework.
PI: Prof. Dr. Diego Gutiérrez.

Modeling and estimation of appearance in 3D objects.
Funded by Diputación General de Aragón. Communauté de Travail des Pyrénées (CTP6/11).
PI: Prof. Dr. Adolfo Muñoz.

Grants and Honors

2016 Bronze medal at the ACM Students Research Competition at SIGGRAPH 2016.

2013 4-years PhD grant. Diputación General de Aragón (State Government).

2012 CAI Europa Grant. *Funding for Porto's Science Faculty visiting research engineer.*

2005 Spanish Baccalaureate - Science and Technology. Zaragoza, Spain. *Graduated with Honors.*

Service

- *SIGGRAPH, SIGGRAPH Asia, Transactions on Graphics, Computer Graphics Forum; Pacific Graphics; Transactions on Applied Perception, Computers & Graphics; SIVP; CVM.* **Reviewer**.
- *CEIG 2014, Spanish Conference on Computer Graphics.* **Local Committee Member**.
- *Eurographics Symposium on Rendering 2013.* **Local Committee Member**.

Students Supervised

2018 **Javier Fabre.** Masters in Computer Graphics, Games and Virtual Reality, Universidad Rey Juan Carlos. *GPU Volumetric Path Tracing for Cloth Rendering (10/10, graduated with honors)*

2014 **Carlos Guillen.** Final Degree Project (Software Engineering). *Rendering realistic hair. (8.5/10)*

2013 **Balma Félez.** Final Degree Project (Industrial Design Engineer). *Asch Psychological Exp. to Virtual Environments. (8/10)*

Teaching Experience

Advanced Rendering — *Universidad Rey Juan Carlos, Madrid*
Masters in Computer Graphics, Games and Virtual Reality — *2018-2019*

Misc.

- Languages: Spanish (native), English (fluent), French (Intermediate, B1 certificate by Official Language School).
- Very passionate about art. Specially painting and photography. Experienced and skilled at drawing, painting and designing, traditional and digital. Proficient in digital illustration and vector drawing (Adobe Photoshop). Some experience in 3D modeling and rendering (Maya, Blender, Zbrush).
- Great people skills: working experience in public relations and customer service at events and fairs.
- Love racquet sports.