

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* 2013
- MSc Thesis: A Biophysically Based Appearance Model for Skin Aging (9.5/10). Graduated with Honors.
- Computer Science Engineer (BSc+MSc)* 2005-2012
- 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 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 virtual 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

- M. Liu, S. Grabli, S. Speierer, N. Sarafianos, L. Bode, M. Chiang, C. Hery, J. Davis, *C. Aliaga* EGSR 2025
Controllable Biophysical Human Faces
 Computer Graphics Forum 44, Issue 4 (2025). DOI: [10.1111/cgf.70170](https://doi.org/10.1111/cgf.70170) 
- 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](https://doi.org/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](https://doi.org/10.1145/3588432.3591554)
- C. Aliaga**, M. Xia, H. 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](https://doi.org/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](https://doi.org/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](https://arxiv.org/abs/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](https://doi.org/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](https://arxiv.org/abs/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1145/3197517.3201282)
- A. Alejandro, **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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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 Fález.** Final Degree Project (Industrial Design Engineer). *Asch Psychological Exp. to Virtual Environments. (8/10)*

Teaching Experience

Advanced Rendering
Masters in Computer Graphics, Games and Virtual Reality

*Universidad Rey Juan Carlos,
Madrid
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.