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| (+34) 659 033 710  [hecbarcab@gmail.com](mailto:hecbarcab@gmail.com)  [User with solid fill](http://hecbarcab.github.io/) | Héctor Barreiro Cabrera  Ph.D. in Computer Science  Passionate about technology and computing. Specializing In Computer Graphics, I explore topics such as physics-based animation, haptic interaction, virtual reality and machine learning.  I was honored with the prize for the best doctoral thesis of the Spanish section of Eurographics at CEIG 2023, affirming my dedication to advancing computer graphics research. |

PROFESSIONAL AND RESEARCH INTERESTS

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| Rocket with solid fill  Physics-based animation | Hill scene with solid fill  Real-time rendering | Gauge with solid fill  High-performance computing | Artificial Intelligence with solid fill  Machine learning | Virtual Reality headset with solid fill  Mixed reality  (AR & VR) | Touchscreen with solid fill  Haptic rendering |

PUBLICATIONS

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| Aug. 2021 | Soft-Tissue Simulation for Computational Planning of Orthognathic Surgery  P. Alcañiz, J. Pérez, A. Gutiérrez, H. Barreiro, Á. Villalobos, D. Miraut, C. Illana, MA. Otaduy  Journal of Personalized Medicine | A close-up of a helmet  Description automatically generated with low confidence |
| Jul. 2021 | Natural Tactile Interaction with Virtual Clay  H. Barreiro, J. Torres, MA. Otaduy  Proc. of World Haptics Conference, 2021 | A picture containing text, indoor, wall, person  Description automatically generated |
| Jul. 2020 | Robust Eulerian-on-Lagrangian Rods  R.M. Sánchez-Banderas, A. Rodríguez, H. Barreiro, MA. Otaduy  ACM Trans. on Graphics (Proc. of ACM SIGGRAPH), Volume 39, Number 4 - 2020 |  |
| Feb. 2020 | Path Routing Optimization for STM Ultrasound Rendering  H. Barreiro, S. Sinclair, MA. Otaduy  IEEE Trans Haptics. 2020 Feb 24. doi: 10.1109/TOH.2019.2963647. |  |
| Jul. 2019 | Ultrasound Rendering of Tactile Interaction with Fluids  H. Barreiro, S. Sinclair, MA. Otaduy  2019 IEEE World Haptics Conference (WHC). IEEE, 2019 |  |
| Nov. 2017 | Conformation Constraints for Efficient Viscoelastic Fluid Simulation  H. Barreiro, I. García-Fernández, I. Alduán, MA. Otaduy  ACM Trans. on Graphics (Proc. of ACM SIGGRAPH Asia), 2017 |  |
| Jul. 2015 | Real-time Inextensible Hair with Volume and Shape  R. M. Sánchez-Banderas, H. Barreiro, I. García-Fernández, M. Pérez Martínez  Congreso Español de Informática Gráfica, 2015 |  |

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| EDUCATION   |  |  | | --- | --- | | Ph.D. in Computer Science  Higher School of Computer Engineering, Universidad Rey Juan Carlos, Spain  Sep. 2016 – Sep. 2021  Development of novel techniques for simulating physical phenomena and haptic rendering.. Supervised by Prof. Miguel A. Otaduy. | Logo, company name  Description automatically generated | | Master’s Degree in Computer Graphics, Videogames and VR  Higher School of Computer Engineering, Universidad Rey Juan Carlos, Spain  Sep. 2015 – Jul. 2016  Covering diverse subjects such as rendering techniques, graphic processors, and physics-based simulation, as well as videogames and virtual reality. | Logo, company name  Description automatically generated | | Bachelor’s Degree in Multimedia Engineering  Higher School of Engineering, Universitat de València, Spain  Sep. 2010 – Sep. 2015  Combines audiovisual communication with computer engineering, especially deepening in multimedia systems and all related areas (graphics, simulation, sound, ...). |  |   COURSES & CERTIFICATES   |  | | --- | | Machine Learning  Stanford Online. @ Coursera | | Neural Networks and Deep Learning  Deeplearning.ai @ Coursera | | Improving Deep Neural Networks: Hyperparameter tuning  Deeplearning.ai @ Coursera | | WORK EXPERIENCE   |  |  | | --- | --- | | Senior Research Scientist  SEDDI Inc, Madrid, Spain  Jun 2022 – Today  Avatar generation pipelines using statistical models. Cloth mechanics simulation R&D. | SEDDI Logo | | Research Engineer  Meta Reality Labs Research, Redmond, USA  May 2021 – Apr 2022  Development of softbody simulation framework for AR/VR. |  | | Research Intern  Meta Reality Labs Research, Redmond, USA  Aug. 2020 – Nov. 2020  Acceleration strategies for high-fidelity simulation methods. |  | | Researcher  Universidad Rey Juan Carlos, Móstoles, Spain  Nov. 2015 – Apr. 2021  Constraint-based model for the simulation of extremely viscous and viscoelastic fluids. Haptic interaction models with virtual fluids. | Logo, company name  Description automatically generated | | Research Intern  Ultraleap Ltd, Bristol, UK  Feb. 2020 – Mar. 2020  Integration of the Handybeam acoustic simulator with MSLab’s soft-body simulation framework. |  | | Researcher  Next Limit Technologies, Madrid, Spain  Dec. 2017 – Sept. 2018  Research of fluid simulation methods and machine learning techniques. Funded by Spain’s government under the *Doctorados Industriales* program (*ref. DI-16-08640*). | Text, logo  Description automatically generated | | Junior Programmer  Instituto de robótica y tecnologías de la información y comunicación. Paterna, Spain  Oct. 2013 – Feb. 2015  Portuary machine simulators and interactive applications |  | |

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| PROFICIENCIES   |  |  | | --- | --- | | Spanish  Native | English  B2\* |   \* Without formal qualification, skill levels stipulated following the CEFR self-assessment table provided by the Instituto Cervantes. | PROGRAMMING LANGUAGES   |  |  |  | | --- | --- | --- | | C++ | C# | Python | | TOOLS OF CHOICE   |  |  | | --- | --- | | IDE | Visual Studio, VS Code, Jupyter | | Frameworks | Eigen, PyTorch, Numpy, Scipy, Sympy | | Source control | Git, Mercurial | | HPC | CUDA, OpenCL, DirectCompute | | Game engines | Unity | |

For further information, please contact me or visit my online portfolio.

Thank you for your time