Alejandro Sztrajman

Nationality: UK, Argentina | London, UK | +44 7492 393393
asztrajman@gmail.com | asztr.github.io | github | scholar | linkedin

Education

PhD in Computer Graphics
University College London (UCL), London, United Kingdom.

BSc in Physics
University of Buenos Aires (UBA), Buenos Aires, Argentina.

Research Experience

University of Cambridge — **Cambridge, UK**
Postdoctoral Researcher — *Mar 2023 – Present*
- Worked at the Rainbow Group with Profs. Rafał Mantiuk and Cengiz Öztireli.
- Co-supervised multiple PhD and MSc students.
- **Research Areas:** neural fields, hypernetworks, physics-based rendering, generative models, novel view synthesis (3DGS), time series.

University College London — **London, UK**
PhD Student — *Sep 2015 – Aug 2022*
- Worked at the Digital Reality Lab, under the supervision of Profs. Tim Weyrich and Tobias Ritschel, funded by a Marie-Curie Fellowship.
- **Research Areas:** neural fields, hypernetworks, physics-based rendering, material appearance, generative models, HDR light representation.

Microsoft — **Reading, UK**
Research Intern — *Nov 2019 – Jun 2020*
- Worked on face relighting and light estimation with Dr. Eric Sommerlade.
- Published results at 3DV and registered as patent.

Adobe — **Clermont-Ferrand, France**
Research Intern — *Aug 2016 – Dec 2016*
- Worked on methods for material appearance transfer between renderers.

Columbia University — **New York City, USA**
Visiting Student — *Mar 2013 – Aug 2013*
- Worked on physics-based animation of fluids with Profs. Eitan Grinspun.

Publications

[1] **High-Dynamic-Range Spherical Gaussian Splatting**
A. Sztrajman, Y. Cai, Y. Liu, R. Mantiuk. ***In Preparation***.
Keywords: novel-view synthesis, Gaussian splatting.

[2] **FrePolad: Frequency-Rectified Point Latent Diffusion for Point Cloud Generation**
C. Zhou, F. Zhong, P. Hanji, Z. Guo, K. Fogarty, **A. Sztrajman**, H. Gao, C. Oztireli. ***In Review at ECCV***.
Keywords: diffusion models, point clouds, spherical harmonics.

[3] **Hypernetworks for Generalizable BRDF Estimation**
F. Gokbudak, **A. Sztrajman**, C. Zhou, F. Zhong, R. Mantiuk, C. Oztireli. ***In Review at ECCV***.
Keywords: neural fields, hypernetworks, material appearance.

[4] **iHyperTime: Implicit Neural Representations for Interpretable Time-Series Generation**
E. Fons, **A. Sztrajman**, Y. El-Laham, A. Coletta, A. Iosifidis, S. Vyetrenko. ***In Review at TMLR***.
Keywords: time-series, neural fields, hypernetworks, generative models.

[5] **Neural Fields with Hard Constraints of Arbitrary Differential Order**
F. Zhong, K. Fogarty, P. Hanji, T. Wu, **A. Sztrajman**, A. Spielberg, A. Tagliasacchi, P. Bosilj, C. Oztireli. **NeurIPS 2023**.
Keywords: neural fields, hypernetworks, constrained learning.

[6] **Color Calibration Methods for OLED Displays**
M. Ashraf, **A. Sztrajman**, D. Hammou, R. Mantiuk. **Color Imaging (2023).**
Keywords: color, neural fields.

[7] **Neural BRDF Representation and Importance Sampling** **Wiley Top Cited Award*
A. Sztrajman, G. Rainer, T. Ritschel, T. Weyrich. **Computer Graphics Forum (Oral at EGSR 2022)**.
Keywords: neural fields, hypernetworks, physics-based rendering, differentiable rendering.

[8] **HyperTime: Implicit Neural Representations for Time-Series**
E. Fons, **A. Sztrajman**, Y. El-Laham, A. Iosifidis, S. Vyetrenko. ***NeurIPS 2022 SyntheticData4ML.***
Keywords: time-series, neural fields, hypernetworks, generative models.

[9] **Machine Learning Applications in Appearance Modeling**
A. Sztrajman. PhD Thesis, University College London, 2022.
Keywords: machine learning, computer graphics, computer vision.

[10] **Fast Blue-Noise Generation via Unsupervised Learning**
*D. Giunchi, ***A. Sztrajman**, A. Steed. **Oral, IJCNN 2022**.
Keywords: blue noise, unsupervised learning, signal processing.

[11] **Mixing Modalities of 3D Sketching and Speech for Interactive Model Retrieval in VR**
D. Giunchi, **A. Sztrajman**, S. James, A. Steed. **Oral, IMX 2021**.
Keywords: 3D sketch retrieval, virtual reality, convolutional Neural Networks.

[12] **High-Dynamic-Range Lighting Estimation from Face Portraits**
A. Sztrajman, A. Neophytou, T. Weyrich, E. Sommerlade. **Oral, 3DV 2020**.
Keywords: convolutional neural networks, HDR light estimation.

[13] **Image-Based Remapping of Spatially-Varying Material Appearance**
A. Sztrajman, J. Krivanek, A. Wilkie, T. Weyrich. **JCGT 2019**.
Keywords: physics-based rendering and shading, non-linear optimization.

[14] **Image-based Remapping of Material Appearance**
A. Sztrajman, J. Krivanek, A. Wilkie, T. Weyrich. **Oral, Eurographics 2017 MAM**.
Keywords: physics-based rendering and shading, non-linear optimization.

Patents

Generating Interpretable Time-Series by Meta-Learning with Implicit Neural Representations
E. Fons, A. Sztrajman, Y. El-Laham, A. Iosifidis, S. Vyetrenko. *US Patent 2023* (Pending).

Estimating Illumination in an Environment Based on an Image of a Reference Object
A. Neophytou, E. Sommerlade, A. Sztrajman, S. Sengupta. *US Patent 2022/0116549 A1.*

Blog Posts

Real NVP Networks. A. Sztrajman.
Statistical Analysis – Friedman Test E. Fons, A. Sztrajman.

Skills

Programming: Excellent programming skills in Python. Experienced with C/C++, JavaScript, HTML/CSS.

Technologies/Frameworks: PyTorch, TensorFlow, Scikit-learn, Numpy, Pandas, OpenCV, Blender/Mitsuba, OpenGL/WebGL, PBS, AWS, git, Linux.

Machine Learning: neural fields, hypernetworks, generative models (VAEs, normalizing flows, diffusion models), novel view synthesis (NeRF, Gaussian splatting), convolutional neural networks.

Computer Graphics: physics-based rendering, shading, perceptual quality metrics, neural rendering, ray tracing, HDR lighting, Monte Carlo importance sampling, Image processing.

Math: Solid background in linear algebra, calculus, 3D math, Fourier analysis, PDEs, numerical methods.

Communication: English (Fluent), Spanish (Native). Proficient writing skills, and good presentation skills.

Talks

Relightable 3D Gaussian Splatting University of Cambridge, UK.	*Dec 2023*
Implicit Neural Representations for Material Appearance. University of Cambridge, UK.	*Mar 2023*
Neural Fields for Data Representation and Generation. Brown University, Providence, USA.	*Oct 2022*
Neural Fields Applications in Urban Science. CUSP, New York University, New York, USA.	*Oct 2022*
CNN-based Face Relighting. Microsoft, Seattle, USA (virtual).	*Mar 2020*
Neural BRDF Importance Sampling. UCL, London, UK.	*Nov 2019*
Capture and Editing of Material Appearance. ETH, Zurich, Switzerland.	*Feb 2018*
Introduction to Convolutional Neural Networks. IST, Klosterneuburg, Austria.	*Nov 2017*

Teaching

Advanced Graphics and Image Processing (Cambridge)	*2023*
Introduction to Graphics (Cambridge, Fitzwilliam College)	*2023*
Advanced Deep Learning and Reinforcement Learning (UCL, COMP0089)	*2019*
Scientific Programming in Python (UCL)	*2017*
Principles of Programming (UCL, COMP101P)	*2015*

Service

Reviewer for ACM SIGGRAPH	*2018, 2022, 2023, 2024*
Reviewer for Computer Graphics Forum	*2023*
Reviewer for IEEE TVCG	*2023*
Program Committee for NeurIPS SyntheticData4ML Workshop	*2022*
Reviewer for IJCNN	*2022*