

Alejandro Sztrajman

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Research Experience

University of Cambridge

Postdoctoral Researcher

Cambridge, UK

Mar 2023 – Present

- Worked at the Rainbow Group, with Profs. Cengiz Oztireli and Rafal Mantiuk, co-supervising multiple PhD and MSc students, and organizing seminar talks.
- **Research Areas:** neural fields, meta-learning, generative models, physics-based rendering, novel view synthesis, visual perception.

University College London

PhD Student

London, UK

Aug 2015 – Jul 2022

- Worked at the Digital Reality Lab, with Profs. Tim Weyrich and Tobias Ritschel, funded by a Marie Curie fellowship.
- **Research Areas:** physics-based rendering, deep learning (neural fields, CNNs, meta-learning), generative models (VAEs, GANs, normalizing flows), Monte Carlo importance sampling.

Microsoft

Research Intern - Applied Sciences Group

Reading, UK

Nov 2019 – Jun 2020

- Worked on light estimation with CNNs and GANs at the Perception Team.
- Published results at 3DV, and registered method as patent.

Adobe

Research Intern

Clermont-Ferrand, France

Aug 2016 – Dec 2016

- Worked on methods for material appearance transfer between renderers.

Columbia University

Visiting Student

New York City, USA

Mar 2013 – Aug 2013

- Worked on physics-based animation of fluids with Prof. Eitan Grinspun.

Education

PhD in Computer Science

University College London (UCL), London, UK.

Thesis: Applications of Machine Learning in Appearance Modeling.

BSc in Physics

University of Buenos Aires, Buenos Aires, Argentina.

Skills

Programming: Strong programming skills in Python. Experienced with C++. Familiar with HTML/CSS/JavaScript.

Technologies/Frameworks: PyTorch, TensorFlow, Scikit-learn, Pandas, SciPy, NumPy, OpenCV, OpenGL, AWS, Git, Linux.

Machine Learning: neural fields, meta-learning (hypernetworks), generative models (VAEs, GANs, normalizing flows, diffusion models), novel view synthesis (NeRF, Gaussian Splatting), convolutional neural networks (CNNs).

Computer Graphics: physics-based rendering, visual perception, HDR imaging, image quality metrics, computational photography, path tracing, Monte Carlo importance sampling, Image processing.

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

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

Publications

High-Dynamic-Range Spherical Gaussian Splatting

A. Sztrajman, Y. Cai, Y. Liu, R. Mantiuk. **In Preparation.**

Keywords: novel-view synthesis, Gaussian splatting.

[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.

[Hypernetworks for Generalizable BRDF Estimation](#)

F. Gokbudak, **A. Sztrajman**, C. Zhou, F. Zhong, R. Mantiuk, C. Oztireli. **In Review at ECCV.**

Keywords: neural fields, meta-learning, sparse sampling, material appearance.

[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, meta-learning, RNNs, generative models.

[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, meta-learning, constrained learning.

[Color Calibration Methods for OLED Displays](#)

M. Ashraf, **A. Sztrajman**, D. Hammou, R. Mantiuk. **Color Imaging 2023**.

Keywords: visual perception, color, image quality metrics.

[Neural BRDF Representation and Importance Sampling](#) *Wiley Top cited Award

A. Sztrajman, G. Rainer, T. Ritschel, T. Weyrich. **CGF** (Oral at **EGSR 2022**).

Keywords: physics-based rendering, neural fields, Monte Carlo importance sampling, differentiable rendering.

[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.

[Fast Blue-Noise Generation via Unsupervised Learning](#)

*D. Giunchi, ***A. Sztrajman**, A. Steed. Oral, **IJCNN 2022**.

Keywords: blue noise, dithering, unsupervised learning, Monte Carlo integration.

[Machine Learning Applications in Appearance Modelling](#)

A. Sztrajman. PhD Thesis, *University College London* (2022).

Keywords: machine learning, computer graphics, computer vision.

[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: CNNs, 3D sketch retrieval, virtual reality.

[High-Dynamic-Range Lighting Estimation from Face Portraits](#)

A. Sztrajman, A. Neophytou, T. Weyrich, E. Sommerlade. Oral, **3DV 2020**.

Keywords: CNNs, HDR lighting, light estimation.

[Image-Based Remapping of Spatially-Varying Material Appearance](#)

A. Sztrajman, J. Krivanek, A. Wilkie, T. Weyrich. **JCGT 2019**.

Keywords: physics-based rendering, material appearance, non-linear optimization.

[Image-based Remapping of Material Appearance](#)

A. Sztrajman, J. Krivanek, A. Wilkie, T. Weyrich. Oral, **MAM 2017**.

Keywords: physics-based rendering, material appearance, 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.

Talks and Presentations

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 (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, Vienna, Austria.

Nov 2017

Teaching

Advanced Graphics and Image Processing (Cambridge)

2023

Introduction to Graphics (Cambridge)

2023

Advanced Deep Learning and Reinforcement Learning (UCL)

2019

Scientific Programming in Python (UCL)

2017

Principles of Programming (UCL)

2016