Gergely Ferenczi

gergely.p.ferenczi@gmail.com
gpf89.github.io/portfolio
1/2, 341 Dumbarton Road
G11 6AL, Glasgow, UK
+44 7964 594004

Profile

I have recently transitioned into Virtual Reality from an academic career in Physics. I have recently gained, at MXT, some full-stack experience in developing a networked real-time interactive virtual reality system developed in Unity, C# & Python including developing Unity editor tooling for the facilitation of workflow and the collaborative design of new tooling. I have also accustomed to the agile paradigm from the more free-form approach of the academic environmet.
I spent my Physics career broadly in the field of Optics, having done work in both quantum and classical imaging and thereby gaining facility in grounding abstract ideas in operational form. Moving between various areas of optics has been a deliberate choice born of the academic mindset of continual learning. I have a bias in favour of breadth over depth in developing my competence. My academic coding experience includes contributions to the relativistic ray-tracer DrTIM.
I work best as part of a team in which we both contributed to me finding my role and not as a lone wolf.

Employment history

Programmer
2022 Oct. - 2025 Mar.

MXT (PGM-1)

Shipped a mixed reality driving simulator with networked traffic that has been used in three driver response studies by WSP and ARUP

Improved the behaviour of the traffic simulation by having taken on the role of team specialist in the traffic simulation tool SUMO. Improved the representation of traffic both in statistical variation of it's various aspects and its visual representation including shader work and performant interpolation of vehicle kinematics. Debugged traffic behaviour & in-house editor tool functionality with the use of automated test scenes, scripted application of third party tools and unit tests.

Helped develop Unity tooling in our Road Editor for editing & exporting the road network and generating traffic for the simulation. Contributed to collaborative design of new tool.

Performed prospective research exploring new tools in service of exploring potential services to meet client needs.

Post-Doctoral Research Asociate
2021 Dec. - 2022 Jun.

Imaging Concepts Group, University of Glasgow (PD-6)

Investigated computational means of undoing artefacts, due to sample motion during scanning, in the light-sheet microscope. Developed code in Python to undo these artefacts based on an iterated process of de- and reconvolutions.

Post-Doctoral Research Asociate
2021 May - 2021 Aug.

Optics Group, University of Glasgow (PD-5)

Investigated the origins of experimentally observed asymmetry in Hong-Ou-Mandel dip shapes. This work is currently subject to further development.

Post-Doctoral Research Asociate
2018 Apr. - 2021 Mar.

Semiconductor Spectroscopy and Devices Group, University of Strathclyde (PD-4)

Worked on the analysis of electron backscatter diffraction image maps of semiconductor substrates using MATLAB. The work focused on characterising samples in particular determining variation in crystal growth orientations of substrates.

Post-Doctoral Research Asociate
2017 Dec. - 2018 Mar.

Quantum Theory Group, University of Glasgow (PD-3)

Studied the statistical properties of photon-added and photon-subtracted states using moment generating functions.

Post-Doctoral Research Asociate
2017 Aug. - 2017 Nov.

Optics Group, University of Glasgow (PD-2)

Worked on the ray tracer DrTIM (The Interactive Metatoy), written in Java. In particular, implemented Fresnel lenses for the purposes of simulating transformation optics devices.

Post-Doctoral Research Asociate
2016 Aug. - 2016 Dec.

Quantum Theory Group, University of Glasgow (PD-1)

Developed, using analytic methods, a novel tomography protocol for the transverse spatial profile of a particle, exploiting two-particle interfence.

Education

PhD 2012 - 2016
Quantum Theory Group, University of Glasgow (ED-2)
Quantum Optics
Which-path problem for one and two particles with two degrees of freedom and a relation between transverse spatial structure and group velocity of light
Supervisor: Prof. Stephen Barnett

MSci 2007 - 2012
Imperial College London (ED-1)
Physics with Theoretical Physics (First-Class Honours)
Applications of singular Sturn-Liouville eigenvalue problems in quantum mechanics
Supervisor: Prof. Yang Chen

Portfolio & publications

Available online at gpf89.github.io/portfolio

Teaching & supervision

2018 - 2020
University of Strathclyde
Co-supervision (with Dr. Carol Trager-Cowan and Dr. Jochen Bruckbauer) of undergraduate project student *2019-2020* (PD-4).

Co-supervision (with Prof. John Jeffers) of undergraduate project studen *2019-2020* (PD-4).

1st year laboratory demonstrator *2018-2019* & *2019-2020* (PD-4).

2014-2015
University of Glasgow
1st year laboratory demonstrator *2014-2015* (ED-2).

Skills

Tech & Science

Organisational

Git,GitLab/GitHub, Jira - version control for individual and collaborative projects

Languages and engines

C#, Unity, - game development including come experience with Shader Graph and the Jobs system

Python - game development, scripted use of third part tools for analysis, image manipulation

SUMO - traffic simulation

C++, Unreal, Java - some experience in game tool and ray-tracer development

MATLAB, MTEX, Mathematica - scripted analysis of data and mathematical modelling

LaTeX, CSS - CV and portfolio design

Arts

Blender, PowerPoint, compass & straight edge methods, free-hand illustration - scientific illustration for talks and publications @gferenczi.science

ffmpeg, DaVinci Resolve - limited video & audio editing for music recordings

Ableton Live - music recording & signal processing

Other

Much of my free-time is spent on near completely autodidactic pursuits of art & music: @gferenczi.art, @gferenczi.music

Designed the Quantum Theory Group's logo which is still in use since 2013.