DR GRISHA SZEP

PERSONAL INFORMATION

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SUMMARY

Experienced researcher of 10 years working in biomedical and computational within academic research groups and software industry. Published works accumulated 165 citations (h-index 3). Expertise in multi-omics, computational modelling and machine learning for biomedicine.

EDUCATION

09/2017 - 03/2022 University of London, King's College

Biophysics & Machine Learning Doctorate

PhD · Randall Division of Cell & Molecular Biophysics
Building novel machine learning algorithms for the inference of state-space structures in dynamical systems, with applications in developmental and synthetic biology. Writing software in Python and Julia in collaboration with Station B at Microsoft Research Cambridge. Published works in NeurIPS Proceedings, Natural Computing, Nature Comms and JuliaCon.
Attila Csikász-Nagy · attila.csikasz-nagy@kcl.ac.uk Neil Dalchau · ndalchau@microsoft.com

09/2011 - 05/2015 University of London, King's College

Physics Masters

First Class · *Physics MSci* · School of Natural & Mathematical Science
Focus on non-equilibrium statistical mechanics, information theory and complex networks. Masters project involved using the Keldysh formalism to investigate angular dependance of molecular current-voltage characteristics.
Project Supervisor: Prof. Lev Kantorovich · lev.kantorovich@kcl.ac.uk

08/2013 - 06/2014 University of California, Berkeley

Exchange Year

GPA: 3.7 · *Physics Major* · College of Letters & Science
Attended lectures at the Redwood Center for Theoretical Neuroscience. Expanded knowledge on analytical mechanics, special relativity, solid state physics and machine learning. Duration of stay motivated academic path and insight into different academic and industrial cultures.
Study Abroad Tutor: Nicola Bonini · nicola.bonini@kcl.ac.uk

WORK EXPERIENCE

09/2017 - 09/2021 Doctoral Researcher, Cambridge

Microsoft

Our aim was to build a new platform for biological programming which would help industry partners, like Oxford Biomedica, scale their efforts to design, build and test bio-manufacturing pipelines. Developed expertise with single cell multi-omics datasets: proteomics (MS/MS), transcriptomics (scRNA-seq) and metabolomics (MS) and flow cytometry data.
Supervisor: Neil Dalchau · ndalchau@microsoft.com

11/2019 - 12/2020 Senior Data Scientist, London

Flux

Delivering business intelligence and consumer analytics on receipt-level transaction data to merchant partners. Applied machine learning with Scala, Python and PostgreSQL; building tools for A/B testing and actionable reports.
Chief Executive Officer: Matty Cusdon-Ross · matty@tryflux.com

11/2016 - 11/2017 **Research Engineer, Delft**

Birds.ai

Development and maintenance of drone image analysis pipeline for agricultural surveillance and industrial inspection. Applied machine learning techniques - convolutional neural networks - deployed scalable and secure web applications using Amazon Web Services.
Chief Executive Officer: Camiel Verschoor · camiel@birds.ai

09/2015 - 11/2016 **Graduate Researcher, Vienna**

Institute of Science and Technology

Rotations in cell migration and biochemistry groups lead to investigation of non-equilibrium responses of Lamellipodial Actin and in vitro reconstituted FtsZ:FtsA vortexes. Used Kinetic Monte-Carlo and deterministic rate equation approaches to model actin polymerisation. Published works in Cell Press.
Dr. Med. Michael Sixt · msixt@ist.ac.at Prof. Karsten Kruse · k.kruse@physik.uni-saarland.de

07/2014 - 09/2015 **Research Intern, NASA Ames Silicon Valley**

NASA Ames Research Centre

Coding of unsupervised machine learning algorithms to classify sleep stages on high resolution single channel electroencephalogram (EEG) recordings. Extraction of biomarkers related to neurophysiological disorders and development of communication software.
Chief Executive Officer: Dr Philip Low · philip@neurovigil.com

06/2013 - 08/2013 **Research Studentship, King's College London**

King's College London

Simulation of photon transport in random lasing process. Collection and analysis of data from experiment. Presentation of findings and evaluation as member of research team.
Research Supervisor: Dr Riccardo Sapienza · riccardo.sapienza@kcl.ac.uk

Sep-Dec 2012 **Market Stall Owner, Camden Market**

Camden Market

Managing market stall in tourist area of north London selling 3D IQ puzzles made of wood and bamboo. Creative presentation and sales to young and old audiences. Financial planning.
Supplier Contact: Ben Meldrum · ben@professorpuzzle.com

COMPUTER SKILLS

Intermediate AWS, Scala, Continuous Integration, C++, PostgreSQL, Lua, Wolfram Mathematica

Advanced Latex, Git, Linux Server Administration, NodeJs, Python, Julia, D3.js, WegGL

Datasets Flow Cytometry, Proteomics (MS/MS). Transcriptomics (sc-RNASeq), Metabolomics (MS)

LANGUAGES

Intermediate Russian, French

Advanced English, German

WORKS

Published

Szep, G. et al. 2021. Advances in Neural Information Processing Systems
Parameter Inference with Bifurcation Diagrams.

Peruzzo, M., Hassani, F. & Szep, G. et al. 2021. Physical Review X: Quantum
Geometric superinductance qubits.

Grant, P. & Szep, G. et al. 2020. Nature Communications 11 (1), 1-8
Interpretation of morphogen gradients by a synthetic bistable circuit.

Dalchau, N. & Szep, G. et al. 2018. Natural computing 17 (4), 761-779
Computing with biological switches and clocks.

Müller, J. & Szep, G. et al. 2016. Cell 171 (1), 188-200. e16
Load-adaptation of lamellipodial actin networks.

In Preparation

Coppard, V. & Szep, G. et al. 2021. Nature Methods: Brief Communications
FlowAtlas.jl : an interactive tool bridging FlowJo and computational tools in Julia.

Conferences

FlowAtlas.jl : an interactive tool bridging FlowJo and computational tools in Julia.
JuliaCon 2021. youtu.be/FeYrFKgP91s

Inference of Bifurcations with Differentiable Continuation.
JuliaCon 2020. youtu.be/vp-206RgeVE

2019. Quantitative Systems Biology Workshop. London. Organisation Committee

2019. Bioinspired analysis of dynamical systems, Hungary. Talk

2018. EMBL Symposium: Biological Oscillators, Heidelberg. Poster

AWARDS & QUALIFICATIONS

Awards

2018 · Microsoft Research PhD Scholarship

2014 · Study Abroad Student Award – King's College London

2013 · The Gordon Rogers Scholarship - Top 5 Performing Students

2013 · Andrewes Prize - Best Examination Performance

2012 · Dillon Prize - Best Examination Performance

Qualifications

2016 · Electron Microscope Training - Institute of Science & Technology

2013 · Basic Laser Safety Certificate - King's College London

2012 · Kids Ski Instructor Certificate - Swiss Snowsports

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