IRL
+49 151 59431576
Berlin, GER
Amsterdam, NL

Abel Jansma

URL
email: abel@jansma.nl
website: abeljansma.nl
GitHub: AJnsm

SUMMARY

Physicist with 6 years of experience developing open source science & software for complex systems, leveraging PyTorch, causal analysis, and distributed computing on large data sets.

EDUCATION

PhD in Precision Medicine | University of Edinburgh　　　　　　　**Sep 2018 - Present**

- I use information theory, machine learning, and causal discovery to construct hypergraphs of gene and protein interactions to infer novel cell identities.
- Developed a complex and highly parallelised bioinformatics pipeline to analyse $> 100k$ genome-wide transcriptomes on an HPC cluster.
- Supervised by Chris Ponting (Institute of Genetics and Cancer), Luigi Del Debbio (Higgs Centre for Theoretical Physics), and Ava Khamseh (School of Informatics).
- Coursework in machine learning and quantum information.
- Completed APTS programme in mathematical statistics at the universities of Cambridge and Oxford.

MSc Theoretical Physics | University of Amsterdam　　　　　　　**Sep 2015 - July 2018**

- Research on Lie algebraic structures in statistical models.
- Thesis: *E8 symmetry structures in the Ising model* (supervised by Bernard Nienhuis)
- Visited the **Niels Bohr Institute** in Copenhagen from Feb to Aug 2016 to study nonequilibrium biophysics and the physics of machine learning.

BSc Physics and Astronomy | University of Amsterdam　　　　　　　**Sep 2012 - July 2015**

- Graduated with Honours/Cum Laude.
- Minor in Computational Science.

Propedeuse in Art and Technology | HKU university of the Arts　　　**Sep 2011 - July 2012**
- Work exhibited at various galleries and festivals in the Netherlands, Germany, and Finland.

WORK EXPERIENCE

Research Associate | University of Edinburgh　　　　　　　　　**Oct 2022 - Present**
- Lead R&D of the `Stator` software package, with users from various subfields of biology.
- Produce and guide original research in an interdisciplinary team.

Information Officer | SciPost　　　　　　　　　　　　　　　　**Oct 2017 - July 2018**
- Expanded the editorial board, profiling and contacting potential new editors.

Member of the Junior Editorial Board | SPUI25　　　　　　　　**Feb 2017 - July 2017**
- Co-organised and presented monthly academic & cultural events for a broad audience.

Distillation Engineer | Mediamatic　　　　　　　　　　　　　**Sep 2016 - Feb 2017**
- Designed, built, and demonstrated a bespoke 30 litre vacuum still for artistic and olfactory research.

Selected Publications and Talks

(A full list is available at https://abeljansma.nl/publications/)

- A compositional game to fairly divide homogeneous cake - A. Jansma 2023 (https://arxiv.org/abs/2301.02281)
- Higher-order in-and-outeractions reveal synergy and logical dependence beyond Shannon-information - A. Jansma 2022 (https://arxiv.org/abs/2205.04440)
- Cybergenetic networks in the mouse brain: higher-order gene regulation and Boolean logic - IGC Biomedical Genomics meeting, Dec 2021 (talk).
- Genetic Interactions and Information Lattices - Mathematical Quantum Physics, University of Innsbruck, Juli 2021 (talk).
- Model-free estimation of higher-order interactions - CSHL Biology of Genomes conference, May 2021 (poster).
- Complex Gene Regulation: Higher-order interactions in single-cell expression data - European Mathematical Genetics Meeting, April 2021 (long talk).
- Complex gene regulation: higher-order interactions in single-cell expression data - CSHL Network Biology conference, March 2021 (poster).
- A maximally noncommittal physicist looks at genetic interactions - IGC Biomedical Genomics meeting, May 2020 (talk).

Awards

Protocol Fellowship | Ethereum Foundation   **Nov 2022 - Present**
- Working with the Robust Incentives group and the Institute for Categorical Cybernetics (CyberCat).
- I model flows of information and resources in complex systems using category theory.

Technology Scholarship | ASML   **Sep 2015 - Sep 2017**
- Selected as one of 25 graduates nationwide for a two-year professional development programme, focused on leadership in technology.

Volunteering

Co-host | Computational Biology Journal Club   **Feb 2019 - March 2020**
- Hosted at the MRC Institute of Genetics and Cancer.

Beekeeper | Anna's Tuin en Ruigte   **Oct 2017 - July 2018**
- Beekeeper at a public permaculture garden.

Reader | VoorleesExpress   **Nov 2016 - Nov 2017**
- I read books to children whose parents were not able to.

Committee member | BetaBreak   **Dec 2014 - Jan 2016**
- Moderated and organised public debates on the role of science and technology in society at Amsterdam Science Park.

Skills

Languages	Dutch (native), English (fluent), German (fluent), French (basic)
Programming	Python, R, Nextflow, bash, Git, Haskell, Mathematica, Processing, Arduino
Visual	LaTeX, SwiftUI, Photoshop, Grasshopper (Rhino)