KASIA KEDZIERSKA

I am a Computational Biologist and Machine Learning Researcher dedicated to advancing methods development and application within biology and healthcare.

Currently, I lead an R&D project focused on **biological Foundation Models** (FMs). During my internship with the **bioML team** at Microsoft Research New England, I evaluated FMs for single-cell biology applications. Previously, at Novo Nordisk Research Centre in Oxford, I used NLP techniques and knowledge graphs to enhance biomedical research. Additionally, with the Turing Data Study Group, I developed a framework using **Transfer Learning** and the **YOLO** model to identify sea pens from ocean floor video footage.

With my extensive expertise in Computational Biology, coupled with a robust background in Data Science and Machine Learning, I am enthusiastic about driving innovations at the intersection of these disciplines.

SELECTED WORK EXPERIENCE

present | 2024
- **Deep Learning Researcher @ DeepLife, Remote**
  Leading an R&D project on Foundation Models in biology, including **mentoring** and supervising a **Master's student**.

2023
- **Intern @ Microsoft Research New England, Cambridge, Massachusetts, USA**
  During the summer I investigated the potential of the **Foundation Models** in the space of single cell biology. I was mentored by Alex Lu, Ava Amini, and Lorin Crawford.

2021
- **Intern @ Novo Nordisk Research Centre Oxford, Oxford, United Kingdom**
  I worked with **NLP and knowledge graphs** to screen **biomedical articles** to identify and prioritise therapeutic targets. To increase the impact of the analysis and increase reach I built and deployed an **interactive dashboard** (using **R Shiny**) to allow colleagues within the company to investigate and visualise the results directly in real-time.

2024 | 2018
- **DPhil Researcher @ Wellcome Centre for Human Genetics, Big Data Institute, University of Oxford, UK**
  In my PhD project I looked at how **chromatin organization** influences **disease initiation and progression** in uterine cancer using multimodal data. I was also working on building and refining ML models of **cancer evolution**, specifically identyfing evolutionary trajectories in the cancer of the uterus.

EDUCATION

2024 | 2018
- **DPhil in Genomic Medicine and Statistics @ Nuffield Department of Medicine, Brasenose College**
  PhD fully funded by the Wellcome Trust Four-year PhD Studentships in Science

2018 | 2015
- **M. Sc. Eng., Biotechnology @ Warsaw University of Technology**
  Master thesis *Analysis of the mutational burden across gene sets in cancer* awarded the title of **The Best Master Thesis in Bioinformatics** defended in 2018.

SELECTED CONFERENCE PRESENTATIONS

2024
- **Invited attendee @ Chan Zuckerberg Initiative AI in Single-Cell Biology Workshop, Redwood City, CA, USA**

2023
- **Chromatin modfiers in endometrial cancer, Poster @ Biology of Genomes 2023, Cold Spring Harbor, NY, USA**

2022
- **Systematic characterisation of chromatin modifiers in endometrial cancer, Poster @ European Association for Cancer Research 2022 Congress, Seville, Spain**

2019
- **Analysis of the mutational burden across gene sets in cancer, Invited talk @ Polish Bioinformatics Society Symposium, Cracow, Poland**

SELECTED AWARDS AND HONORS

2023
- **JXTX + CSHL 2023 Biology of Genomes Scholarship @ JXTX Foundation, Cold Spring Harbor Laboratory**
  Awarded to outstanding graduate students in genomics and data sciences.

2022
- **Graduate Prize in the 'Outstanding work outside degree' category @ Nuffield Department of Medicine, University of Oxford**
  Each year Nuffield Department of Medicine, based on nominations, awards selected PhD students based on their performance within and outside of their degree.

2023 | 2021
- **Senior Hulme Scholarship @ Brasenose College, University of Oxford**
  Senior Hulme Scholarship is awarded by Brasenose College, University of Oxford to DPhil students whose academic performance is deemed to be exceptional.

View this Resume online
kasia.codes/resume/

CONTACT

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CODING SKILLS

- R
- Bash
- Python
- AWK
- SQL
- Perl

Python:
`PyTorch`, `Lightning`, `scverse/scanpy`, `scikit-learn`, `NumPy`, `Pandas`, `Seaborn`, `matplotlib` and more

R:
`tidyverse`, `data.table`, `Shiny`, `plotly`, `tidymodels`, `caret` and others

High Performance / Cloud Computing:
`SLURM`, `SGE`, `Google Cloud`, `Scaleway`, `Microsoft Azure`, `Azure Blob Storage`, `AWS Cloud Storage` and more

LANGUAGES

- Polish
- English
- French

CV source code. Made with pagedown, based on nstrayer/cv.
Last updated on 2024-10-07.

SELECTED PUBLICATIONS

Full list of publication is available through my Google Scholar profile scholar.google.com/citations?user=Yv6poTwAAAAJ.

2023 • **Assessing the limits of zero-shot foundation models in single-cell biology @ bioRxiv**
K. Z. Kedzierska, L. Crawford, A. P. Amini, A. X. Lu ✨ **This work was featured in The New York Times**✨

2023 • **Data Study Group Final Report: CEFAS - Automated identification of sea pens using OpenCV and machine learning @ Zenodo**
In alphabetical order: M. Asthana, R. Blackwell, S. Davis, A. Downie, J. Forsyth, **K. Kedzierska**, R. Mestre, Z. Reza, J. Ribeiro, P. Palola, Y. Said

2023 • **Functional analysis reveals driver cooperativity and novel mechanisms in endometrial carcinogenesis @ EMBO Molecular Medicine**
M. Brown, A. Leon, **K. Kedzierska**, C. Moore, H. L. Belnoue-Davis, S. Flach, J. P. Lydon, F. J. DeMayo, A. Lewis, T. Bosse, I. Tomlinson, D. N. Church

2020 • **Prognostic integrated image-based immune and molecular profiling in early-stage Endometrial Cancer @ Cancer Immunology Research**
N. Horeweg, M. de Bruyn, R. A. Nout, E. Stelloo, **K. Kedzierska**, A. León-Castillo, A. Plat, K. D. Mertz, M. Osse, I. M. Jürgenliemk-Schulz, L. C.H.W. Lutgens, J. J. Jobsen, E. M. van der Steen-Banasik, V. T. Smit, C. L. Creutzberg, T. Bosse, H. W. Nijman, V. H. Koelzer and D. N. Church

2019 • **Dynamics of cardiomyocyte transcriptome and chromatin landscape demarcates key events of heart development @ Genome Research**
M. Pawlak, **K. Z. Kedzierska**, M. Migdal, K. A. Nahia, J. A. Ramilowski, L. Bugajski, K. Hashimoto, A. Marconi, K. Piwocka, P. Carninci and C. L. Winata

2018 • **SONiCS: PCR stutter noise correction in genome-scale microsatellites @ Bioinformatics**
K. Z. Kedzierska, L. Gerber, D. Cagnazzi, M. Krützen, A. Ratan, L. Kistler

SUMMER SCHOOLS & HACKATHONS

2022 • **Sea pen identification from video footage challenge @ Turing Data Study Group @ The Alan Turing Institute, London, UK**

2019 • **Machine Learning Summer School @ Imperial College London, University College London, London, UK**

SELECTED TEACHING EXPERIENCE

2022 • **Unsupervised learning @ NGSchool2022: Machine Learning in Computational Biology, Jablonna, Poland**
I co-led, with Kaspar Märtens, lecture and tutorial sessions on unsupervised learning and its use cases in computational biology. All materials are availble at github.com/kzkedzierska/ngs22_unsupervised.

2021 • **Data visualization in bioinformatics - hackathon mentor @ Online hackathon NGSprint, Discord**
I led the hackathon in data viusalisation with emphasis on computational biology. Teaching materials are available at github.com/kzkedzierska/NGSprint_data_viz.

2020 • **Online tutorials: Python for Data Science and Introduction to Python @ NGSeminars, YouTube**
I led two Python tutorials: **Introduction to Python** kasia.codes/talk/intro_to_python/ and **Python for Data Science** kasia.codes/talk/py4ds/.

2019 • **Introduction to R @ Wellcome Centre for Human Genetics, Oxford, UK**
8 week course in Introduction to R, Data Manipulation, Data Visualisation and RNA-seq data analysis.

2019 • **Introduction to Managing Code with Git @ Wellcome Centre for Human Genetics, Oxford, UK**
I led a 2-hour introduction to working with Git. Materials, including slides and exercises are available at kasia.codes/talk/into_to_git/.

€ SELECTED GRANTS

2022 | 2020 • **Visegrad Grant to organise NGSchool2022 @ Visegrad Fund**
32,190 EUR awarded towards organising affordable training and conference focusing on ML application in Computational Biology. During this project I managed an international team of volunteers and led the organisation of summer school, conference, online seminars and hackathon.

2023 | 2018 • **Scientific grant as part of Wellcome Trust funded DPhil @ Wellcome Trust**
30,000 GBP towards research expenses for the PhD project which allowed me to design and led pilot experiments, managing the grant for successful execution of research objectives.

NON-PROFIT WORK

2022 | 2018 • **President @ NGSchool Society**
The goal of the Society is to promote and support science, with emphasis on computational biology.