

David Novak








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Bioinformatician with proficiency in statistical data analysis, machine learning and software engineering




Employment History

- 2020–Q2 2025  **Bioinformatics researcher: exploratory modelling of single-cell data.** *Saey's Lab, VIB-UGent, Belgium.*
Working with the Vaccine Research Center, NIH I designed and validated *iidx*: an end-to-end pipeline for large-scale statistical analysis of complex age- and sex-associated immunophenotype changes in a 2196-donor flow cytometry cohort.
Having initiated a collaboration with UCLouvain, I developed *ViVAE* and *ViScore*: a novel VAE-based dimension-reduction model with QC measures grounded in differential geometry, and a framework for evaluating embeddings of single-cell datasets.
- 2021–2025  **Assistant lecturer: machine learning.** *Ghent University, Belgium.*
Over 4 years, I have provided guidance and designed and given practical sessions for over 200 students.
- 2018–2020  **Programmer and researcher: computational cytometry.** *Childhood Leukaemia Investigation Prague, Czech Republic.*
I co-developed *tviblinDi*: a semi-supervised trajectory inference solution using persistent homology, accessible to wet lab scientists within the group. This allowed us to build multi-organ models of human B-cell and T-cell development.
- 2012–2020  **Translator and assistant: EU subsidy programmes.** *MIDA Consulting, Czech Republic.*
- 2018  **Lecturer: ESL.** *Channel Crossings, Czech Republic.*
- 2017–2018  **Lecturer: computer programming for children.** *Logischool, Czech Republic.*
- 2015  **Research intern: cellular neurophysiology.** *Czech Academy of Sciences, Czech Republic.*



Education

- 2020 – Q2 2025  **PhD Bioinformatics.** *Ghent University, Belgium. Supervisor: Prof Yvan Saey's.*
- 2018 – 2020  **MSc Bioinformatics.** *Charles University, Czech Republic.*
- 2015 – 2018  **BSc Biological Sciences.** *Charles University, Czech Republic.*

Skills and competencies

- IT  Advanced data analysis, ML and statistics in *R* and *Python*. Modern deep learning frameworks and high-performance computing. Front-end development in *R Shiny*, *React*.
Familiar with *.NET*, *xUnit*, *C++*, *Java*, *HTML/CSS*, *SQL*, *Bash*, *Slurm*, *Docker*, *AWS*, *Git*, *GitLab* CI/CD, *OpenMP*, *Boost*, *numba*, *Optuna*, *Nextflow*.
- Comp-bio  NGS data analysis. Large and maintainable computational cytometry and single-cell 'omics workflows. Interpretable machine learning in single-cell. Scientific writing and teaching. Advanced data visualisation.
- Languages  Fluent English, Czech, Slovak. Conversational German. Basic Dutch.

Extracurriculars

- 2024  **Computational Cytometry Summer School co-organiser.** *VIB-UGent, Belgium.*
I designed and led a session on robust statistical analysis of experimental cytometry data.
- 2014–2015  **Hospital volunteer.** *Lékořice foundation, Prague, Czech Republic.*