Thomas Chris Smits

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Passionate bioinformatics graduate with a focus on data visualization and development of analysis tools, especially in the realms of genomic and spatial data. Eager to leverage my skills in Python, R, and JavaScript/TypeScript to bring innovative and visually captivating solutions to complex biological datasets.

Education

2021 - 2023 **Master of Biomedical Informatics**
Harvard Medical School
- Relevant coursework: Genomic Data Manipulation, Deep Learning for Biomedical Data, Cancer Genome Data Science, Biomedical Data Visualization, Computing for Big Data, Biological Systems Modeling [MIT]

2020 - 2021 **Transfer program in Computer Science**
Delft University of Technology
- Relevant coursework: Object-Oriented Programming, Logic, Algorithms, Web- and Database Structures, and Microservices Software Engineering

2017 - 2020 **Bachelor of Science in Life Science & Technology** *(Honors & Summa cum Laude)*
Delft University of Technology & Leiden University (joint degree)
- Relevant coursework: Bioinformatics, Life Sciences, Calculus, Statistics
- Honors program Beta & Life Sciences at *Leiden University*
- Study abroad at the *University of British Columbia*

Research Experience

2023 – present **Associate in Biomedical Informatics**
Harvard Medical School | Department of Biomedical Informatics | dr. Nils Gehlenborg
- Lead projects:
  - Creating automatic text generation for accessibility of genome-mapped data visualization with TypeScript, using genome-mapped visualization tool Gosling (AltGosling).
  - Development of web-based interactive visualization for single-cell data with TypeScript and D3.js (CellPop).
  - Creating integrated analyses of spatial and single-cell data in the HuBMAP consortium Data Portal with Python (Workspace templates).
  - Comparison of different techniques of introducing genomics visualization to a blind individual.
- Contributing projects:
  - State of the art overview of spatial omics visualizations
  - Multimodel search engine for genomics visualizations
  - Accessibility of life science resources
  - Keyboard navigation of visualizations
- Mentored intern from HuBMAP Underrepresented Student Internship program (2023) and intern from Summer Institute in Biomedical Informatics (2024)

2022 **Graduate Student**
Harvard Medical School | Department of Biomedical Informatics | dr. Nils Gehlenborg
- Lead project: Development of automatic feature extraction in JavaScript for written descriptions of visualization in grammar-based genomic visualization tool Gosling

2021 – 2022 **Graduate Student**
Dana-Farber Cancer Institute | Department of Data Science | dr. Mehmet Samur
- Lead project: mutational burdens and signature analysis of hyperdiploidy in multiple myeloma.
- Contributing projects: investigation of ChIP-seq, ATAC-seq, CLIP-seq and RNAs-seq data with differential analyses in R with Bioconductor, including conversion and peak calling from raw data.

2020 **Undergraduate Researcher**
Delft Bioinformatics Lab | dr. Thomas Abeel & dr. ir. Robert Mans
- Lead project: Developing various models in Python for prediction of potential hosts of SARS-CoV-2 by analyzing ACE2 receptor sequences

Teaching Experience

2023	Harvard Medical School • Teaching assistant for Deep Learning for Biomedical Data for Master in Biomedical Informatics. • Teaching assistant for Computationally-Enabled Medicine for Doctor of Medicine.
2021	Delft University of Technology • Teaching assistant for Biotechnology in BSc Life Science & Technology.
2018 - 2020	Leiden University • Teaching/laboratory assistant for Biochemistry 1 at BSc Bio-Pharmaceutical Sciences. • Teaching assistant for Calculus 2 in BSc Life Science & Technology. • Student coach at BSc Life Science & Technology. • Teaching assistant for Biotechnology summer school in BSc Life Science & Technology.

Awards

2022	American Society of Hematology **Abstract Achievement Award**	*659 out of ~25 000 participants*
2022	International Myeloma Society **Young Investigator Award**	*25 out of ~200 participants*
2020	**Summa cum laude** jurisdiction for BSc. Life Science & Technology	*top 1 out of 100 students*
2019	HOLLAND **scholarship** 2019 for exchange at the University of British Columbia	*top ~10%*
2018	Royal Holland Society of Sciences and Humanities (KHMW) **Young Talent Award** in the discipline Chemistry of Life	*67 out of ~100 000 1st year university of the Netherlands*
2018	**Summa cum laude** jurisdiction for 'propedeuse' (first year) for BSc. Life Science & Technology	*top 2 out of 150 students*

Skills

- **Programming & Tools**: Python (Pandas, Scikit-learn, Matplotlib, Seaborn, TensorFlow, Keras), R (tidyverse, Bioconductor (e.g., DiffBind), RCPP), JavaScript/TypeScript (Web development, React, Vite), Data visualization (D3.js, Vega-Lite, Altair, Gosling), SQL (MySQL, PostgreSQL), Git, Microsoft Excel
- **Biological Data Analysis***:* Single-cell (epi)genomics, transcriptomics, and spatial datasets
- Laboratory techniques: PCR, gel analysis, mutagenesis, kinetics, microscopy, mass/fluorescence spectroscopy

Selected Publications

- Keller et al. (2025). The State of Single-Cell Atlas Data Visualization in the Biological Literature (under review at *EuroVis 2025*). https://osf.io/preprints/osf/yt3xz
- **Smits** et al. (2024). AltGosling: Automatic Generation of Text Descriptions for Accessible Genomics Data Visualization, *Bioinformatics 40*(12), btae670. https://doi.org/10.1093/bioinformatics/btae670
- **Smits** et al. (2022). *Somatic Changes Prior to the Development of Hyperdiploidy Expose Mutation Accumulation Rate and Activated Processes in Multiple Myeloma*. 64th ASH Annual Meeting and Exposition, New Orleans, LA. https://doi.org/10.1182/blood-2022-168837

For a full overview of publications, please visit my website, ORCID or Google Scholar page.