

France ROSE, Ph.D. (she/her)

Junior Group Leader, Emmy Noether Fellow
Universität Bonn - Informatik III

Friedrich-Hirzebruch-Allee 8, 53115 Bonn

Personal webpage : www.normalesup.org/~froese/

Email : frose1@uni-bonn.de

Research and professional experience

- 2025 - Junior Group Leader**
Department of Computer Science, University of Bonn, Germany.
Complex and subtle behavior analysis enabled by unsupervised deep learning.
- 2021 - 2025 Post-doctoral researcher**
Bozek Lab – Data Science of Bioimages. *Center of Molecular Medicine Cologne (CMMC), University of Cologne, Germany.*
Deep learning analysis of rodent behavior through 3D motion-tracking data and of spatial interaction of immune and cancer cells with mass spectrometry imaging
- Oct - Dec 2023 & Mar 2025 – **Visiting researcher**
Neuronal Rhythms in Movement Unit (Prof. Marylka Yoe Uusisaari). *Okinawa Institute of Science and Technology (OIST), Japan.*
- 2019 - 2021 Biomedical data scientist**
MyndBlue. Start-up incubator X-Novation - Ecole Polytechnique, Palaiseau, France.
Development of machine learning platform for Major Depression and PTSD prediction and prognosis.
- 2016 - 2019 Ph.D. student**
Computational BioImaging & Bioinformatic. Group of Auguste Genovesio. *Institut de Biologie de l'ENS (IBENS), Paris, France.*
Analysis of cell phenotypical and spatial heterogeneity from microscopy images in the context of High-Content Screening.
- Aug - Nov 2018 – **Visiting researcher**
Spatial Metabolomics. Group of Theodore Alexandrov. *European Molecular Biology (EMBL), Heidelberg, Germany.*
Statistical spatial analysis of combined microscopy images and spatial metabolomics data, released as a *Python* package, *PySpacell*.
- Feb - Jun 2016 **R&D intern**
KeenEye Technologies. Start-up incubator Institut de la Vision, Paris, France.
Development of an image analysis pipeline to detect colocalization on mouse brain slices.
- Jul - Dec 2015 **Research Intern**
Center for Discovery and Innovation in Parasitic Diseases. Group of Jim McKerrow.
Supervision : Jair Lage de Siqueira Neto. *Skaags School of Pharmacy and Pharmaceutical Sciences, University of California San Diego, USA.*
Development of a robust method to access host cell and parasites counting, and their morphological properties as a part of a high throughput screening facility.

- Feb - Jun 2014 **Master 2 research intern**
Computational Biology & Bioinformatic Platform. Group of Auguste Genovesio. *Institut de Biologie de l'ENS (IBENS), Paris, France.*
Development of a fully automated analysis of image sequences of cell division generated by live microscopy.
- Jun - Jul 2013 **Research intern**
Molecular Adaptation and Genome evolution, Prof. Dmitri Petrov. *Stanford University, USA.*
Using positive selection measurement to detect co-adaptation during Mammalian evolution.
- Feb - Jun 2013 **Master 1 research intern**
Single Molecule Nanometry, Prof. Taekjip Ha. *University of Illinois at Urbana-Champaign, USA.*
Study of the looping of small double-stranded DNA molecules (around 80bp) with a smFRET microscopy.

Education

- 2016 - 2019 **Ph.D. in Bioinformatics and System Biology**
Institute of Biology of ENS (IBENS)
Université Pierre et Marie Curie (Paris 6)
Doctorate school *Life Complexity* (Complexité du Vivant)
- 2011 - 2016 **École Normale Supérieure (ENS)**
Major : Biology – minor : Physics
ENS is a small selective institution focused on educating future researchers and university lecturers in a four-year curriculum.
- 2012 - 2014 **Master in Bioinformatics and Modelization**
ENS Ulm - Université Pierre et Marie Curie (Paris 6)
- 2011 - 2012 **Licence in Biology (French bachelor's degree)**
ENS Ulm - Université Pierre et Marie Curie (Paris 6)
- 2009 - 2011 **Classe préparatoire aux grandes écoles (CPGE) in Biology, Physics, Chemistry and Mathematics**
Lycée Henri 4 (highschool), Paris.
CPGE is a two-year intensive course preparing for highly competitive national entrance examinations to French "Grandes Écoles", including engineering schools and the ENS. It is equivalent to the first 2 years of a Bachelor degree.

Fellowships and programs

- 2025 - 2031 6-year Emmy Noether starting grant (~1.5M€) (DFG, Germany).
- 2023 - 2025 2-year Künstliche Intelligenz (Artificial Intelligence)-starter grant for young researchers (Nordrhein-Westfalen, Germany).
- 2022 5-week Quantitative Biology Summer Course at KITP, "Neurophysics of Locomotion" (UC Santa Barbara).
- 2018 4-month DAAD (Deutscher Akademischer Austauschdienst) fellowship for PhD students for a collaboration with a laboratory in Germany.
- 2016 - 2019 3-year Doctoral fellowship. Ecole Normale Supérieure, Paris.

Teaching experience

- | | |
|-------------|--|
| 2025 | Teaching Assistant in Computer Vision, Master level
Professor : Katarzyna Bozek
University of Cologne, Germany. |
| 2019 | Teaching Assistant in Programming, 1st year of Bachelor
Professor : Virginie Gabrel-Willemin
Paris Science Lettres (PSL) University, Paris. |
| 2016 - 2018 | Teaching Assistant in Cell and Molecular Biology, and Developmental Biology, 2nd year of Bachelor
Professors : Zsolt Lenkei & Xavier Morin
Paris Science Lettres (PSL) University, Paris. |
| 2014 - 2015 | Oral examiner in Mathematics and Informatics, 1st year of CPGE BCPST (equivalent 1st year Bachelor)
Teachers : Martine Ginestet & Mlle Launay
Lycée Fénélon & Lycée Saint Louis (highschools), Paris. |

Oral presentations

"Deep Learning Imputation for SKkeleton data (DISK)"

- *MLinPL conference*, Warsaw, Poland. Nov 7th-11th 2024. (Talk – video : <https://shorturl.at/xCmDg>)
- *DataNinja sAIONARA 2024 conference*, Bielefeld, Germany. June 2024. (Short talk)
- *Measuring Behavior*, Aberdeen, Scotland. May 2024. (Tutorial)
- *MOTOR CRC "Key Mechanisms of Motor Control in Health and Disease" lecture series*, Cologne, Germany. April 2024. (Talk)

"Imaging Mass Spectrometry Analysis"

- *"Integration and analysis of multiplex imaging technologies" workshop*, Center of Molecular Medicine Cologne Annual Retreat, Cologne, Germany. March 2023.

"Spatial heterogeneity of cell responses in drug treatment"

- *Young Researchers in Life Science Conference*. Paris, France. June 2019.
- *Quantitative BioImaging conference*, Göttingen, Germany. Jan 2018.

Posters

"Deep Learning Imputation for SKkeleton data (DISK)"

- *Machine Learning Workshop*, OIST, Japan. March 2025.
- *Society for Neuroscience 2024 conference*, Chicago, USA. Oct 2024.
- *MOTOR CRC "Motor Mastery" symposium*, Cologne, Germany. Sept 2024.

"Studying spatial heterogeneity of cell responses to cancer drugs"

- *2018 SLAS Advanced 3D Human Models and High-Content Analysis Conference*. Leiden, Netherlands. Oct 2018.

"Quantifying the heterogeneity of cell responses to cancer drugs"

- *Young Researchers in Life Science Conference*. Paris, France. May 2017.
- *France BioImaging meeting*. Paris, France. April 2017.
- *StatLearn meeting*, French Society of Statistics (SFDS). Lyon, France. April 2017.

Outreach

- | | |
|-------------|--|
| 2025 | Speaker "How animals move and what AI sees"
"Take your science to the streets" event, <i>Soapbox Science</i> , Düsseldorf. |
| 2020 - 2023 | Founder, president, and tutor in Programming
Weekly coding classes tailored for high-school girls, Association <i>Coding Sisters</i> , Paris and online. |
| 2017 | Research tutor
Bi-weekly research sessions for high-school students, <i>Apprentis Chercheurs</i> program, <i>L'arbre des connaissances</i> association, Paris. |
| 2011 - 2012 | Tutor in Biology
Monthly classes for high-school students, Association <i>TaIENS</i> , Paris. |

Selected publications (5 most relevant)

- **Rose, F.** [✉], Michaluk, M., Blindauer, T., Ignatowska-Jankowska, B., O'Shaughnessy, L., Stephens, G., Pereira, T., Uusisaari, M.Y. & Bozek K. [✉] **Deep Imputation for Skeleton Data (DISK) in Behavioral Science.** *Nature methods* (2025). <https://doi.org/10.1038/s41592-025-02893-y>
- **Rose, F.** ^{*} [✉], Ibruli, O. ^{*}, Lichius, L., Kiljan, M., Gozum, G., Caiaffa, M.I., Cai, J., Niu, L.N., Herter, J.M., Gröll, H., Büttner, R., Beleggia, F., Bosco, G., George, J., Herter-Spie, G.S., Reinhardt, H.C. & Bozek, K. **Imaging mass cytometry dataset of small-cell lung cancer tumors and tumor microenvironments.** *BMC Res Notes* (2025). <https://doi.org/10.1186/s13104-025-07460-4>
- Stahl, D., Gödel, P., Balke-Want, H., Gholamipoorfard, R., Segbers, P., Tetenborg, L., Koker, M., Dörr, J., Gregor, L., Bachurski, D., **Rose, F.**, Simon, A. G., Good, Z., Jakob, J., Häupl, B., Nill, M., Flümman, R., Riet, T., Lange, D., Blakemore, S. J., Baurmann, H., Voltin, C.-A., Potter, N., Schlözer, L., Freihammer, M., Wagener-Ryczek, S., Iuga, A.-I., Heger, J.-M., Ludwig, H., Schleifenbaum, J. K., Propp, J., Bröckelmann, P. J., Jachimowicz, R. D., Knittel, G., Bochmann, S., Merkelbach-Bruse, S., Pallasch, C., Peifer, M., Rybniker, J., Quaas, A., Nitz, M., Brägelmann, J., Müller, W., Persigehl, T., Bozek, K., Theobald, S. J., Büttner, R., Oellerich, T., Hallek, M., Kobold, S., Chmielewski, M., Reinhardt, H. C., Mackall, C., Abedpour, N., Borchmann, P. & Ullrich, R. T. [✉] **CSF1R+ myeloid-monocytic cells drive CAR-T cell resistance in aggressive B cell lymphoma.** *Cancer cell* (2025). <https://doi.org/10.1016/j.ccell.2025.05.013>
- **Rose, F.**, Rappez, L., Triana, S. H., Stadler, M., Heikewalder, M., Alexandrov, T. & Genovesio, A. [✉] **PySpacell : A Python package for spatial analysis of cell images.** *Cytometry Part A* (2020). <https://doi.org/10.1002/cyto.a.23955>
- **Rose, F.** ^{*}, Basu, S. ^{*}, Rexhepaj, E., Chauchereau, A., Del Nery, E. & Genovesio, A. [✉] **Compound Functional Prediction Using Multiple Unrelated Morphological Profiling Assays.** *SLAS TECHNOLOGY : Translating Life Sciences Innovation* (2017). <https://doi.org/10.1177/2472630317740831>

[✉]. Corresponding author

^{*}. Co-first authors